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# PRINT CONTROL

All the keen photographer needs about making the best prints from his negatives

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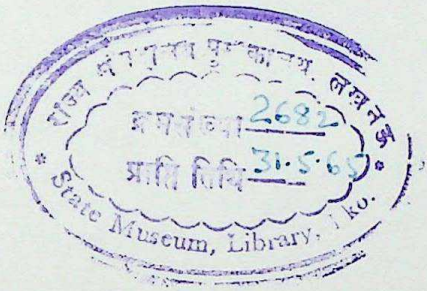
by

M. P. WOOLLER

A.R.P.S.

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# Foreword

When I first took up photography, 'control' meant nothing to me, but having learned what it was, my first reaction was of course to dislike it. It was only when I began to realise the limitations of photography as a means of expression, that I developed an interest in it.

I found a dearth of practical information on the subject, and learned most of the processes described in this book the hard way — by trial and error. I believe there are many who are discouraged because of the difficulties they imagine. In this book I have endeavoured to make it easier for them, by explaining the methods I have found useful when preparing prints for exhibition purposes.

I should like to express my thanks to Mr H. R. Verry, A.R.P.S., Mr A. J. Jackson, A.I.B.P., and Mr J. H. Kennard, all of whom have read the MS. and made many helpful suggestions.

M. P. WOOLLER

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I

# The Case for Print Control

The techniques of print control will probably always promote controversy, for not only is there scope for argument as to how they should be done, but it is frequently claimed that they shouldn't be practised at all. The purists profess disgust at what they feel (or say they feel) to be deliberate deception, while their opponents no doubt delight in incurring their greater displeasure, by describing in detail just how they have falsified reality. Despite the fierceness of the exchanges it is very harmless, and indirectly an important factor in the value of our hobby as a form of educational recreation.

It is a feature of the best hobbies or sports, that the techniques employed in their pursuit, encourage discussion. Then if we have any views at all, we must be prepared to defend them, to muster evidence in their favour, or at least examine the contentions of their detractors. The social value of debate, and the stimulus to express oneself clearly, are certainly not least among the by-products of photography as a hobby.

So let us welcome criticism of the control processes, so that we may be encouraged to explain to others what it is we do, and how and why we do it. The strongest evidence is a demonstration of the result: if it passes there may be a convert to the ranks of 'fakers', if it fails it may be that the work was poorly done, and that the methods need reviewing. It is worth examining this possibility rather carefully, before blaming the critic's obstinacy.

Many amateur photographers start with simple apparatus, and an ambition limited at first to the desire that everything shall 'come out'. Joining a camera club introduces them to other photographers, and if they are genuinely interested, the urge to improve soon follows. Gradually by a process of trial and error, techniques

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are evolved which enable them to produce good quality prints, and at the same time they may develop a flair for one particular branch of their hobby. But if they remain content merely to make prints which satisfy themselves, and impress their friends, without becoming interested in the expressive power of the medium, one of the greatest pleasures that can be derived from photography is missing.

Photography cannot compete with painting as a means of expression, but it is still capable of producing artistic results. More: by virtue of its capacity to reproduce tone values, in an infinite variety of monochromatic shades, from pure white to deepest black, it is a recording process of unique beauty. To appreciate its immense technical advantages, one has merely to compare a photograph with an etching. The highlight detail in a first-class photograph, the lights which gleam from the edge of a bank of snow, comprise an area of many subtle tones of palest grey, grading to minute patches of pure white; a quality which the etcher can never match.

There are those who ultimately view photography as a means whereby they may create pictures, having their own peculiar appeal — which is not an imitation of, or an apology for painting, but a medium of expression in its own right. They may indeed adopt it because they lack the manipulative ability to become first-class artists, or even for the more mundane reason that painting demands the abandonment of time in its pursuit; but an inherent interest in painting does not condemn all else as a mediocre alternative: rather is it evidence that the creative spark burns within, and that photography as a hobby has much to offer.

It is for these that this book is intended. The painter is not accused of cheating when he moves a house, omits an array of telegraph poles, or places an appropriate, but imaginary figure just where it is wanted. Fidelity is not his aim; his intention is to create a picture, which is essentially a pattern which tells a story. He feels what he wishes to convey, and his skill is the subtle expression of his mind, in the deft touch of practised fingers.

The photographer, with his much less flexible medium, cannot hope to emulate the inspired artist, but if he can visualize the

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result, not as a picture to please himself, and to evoke memories, but as an expression of a mood, or a design, photography will serve him well as an artistic medium.

Plate 34 is the kind of subject which would attract any photographer. It is a typical fine-weather 'view', of which we see hundreds every year. It is merely a record, and has no artistic appeal because it conveys no particular emotion, it is just 'Ullswater from High Up'.

Plate 2 is different, and comparing it with Plate 1, see how a picture has been created, and a mood conveyed by the treatment. Selecting the viewpoint and waiting for an appropriate figure in the right place, determines the composition. Plate 1 shows that the arrangement was quite good, and that the theme was there, but the lack of tone in the sky spoiled it. The addition of a suitable sky when enlarging has created the effect intended, and produced the glowing light of sunset. The figure caught just where the road begins to disappear, seems lonely and wistful, and there is a romantic quality about the print, quite lacking from the prosaic record of Ullswater. But without control, it could not have achieved its promise.

When making the exposure, the photographer should know what he intends, but it is usually in the processing of the print that the purpose must have full expression: ferricyanide may be needed to put laughter in the water, gold toning to put the chill back in the April wind, and oil reinforcement to simplify and unite the whole. If they achieve their object, and are applied in such a way as not to mar the essentially photographic quality of the print, their use will have increased the pleasure of those who see the picture.

Consider Plates 3 and 4; see how in the straight print there is little tonal difference between foreground and distance, how out of place are the two telegraph poles, and how featureless is the sky. Printing up the foreground, and holding back the distance has improved the quality of the water, and created a feeling of recession. By removing the telegraph poles, the fugitive urban air has been lost, and by printing up the sky, the shifting shadows gather strength. Nothing elaborate, but each step serves, either to remove distractions, or to improve some feature where emphasis was lacking.

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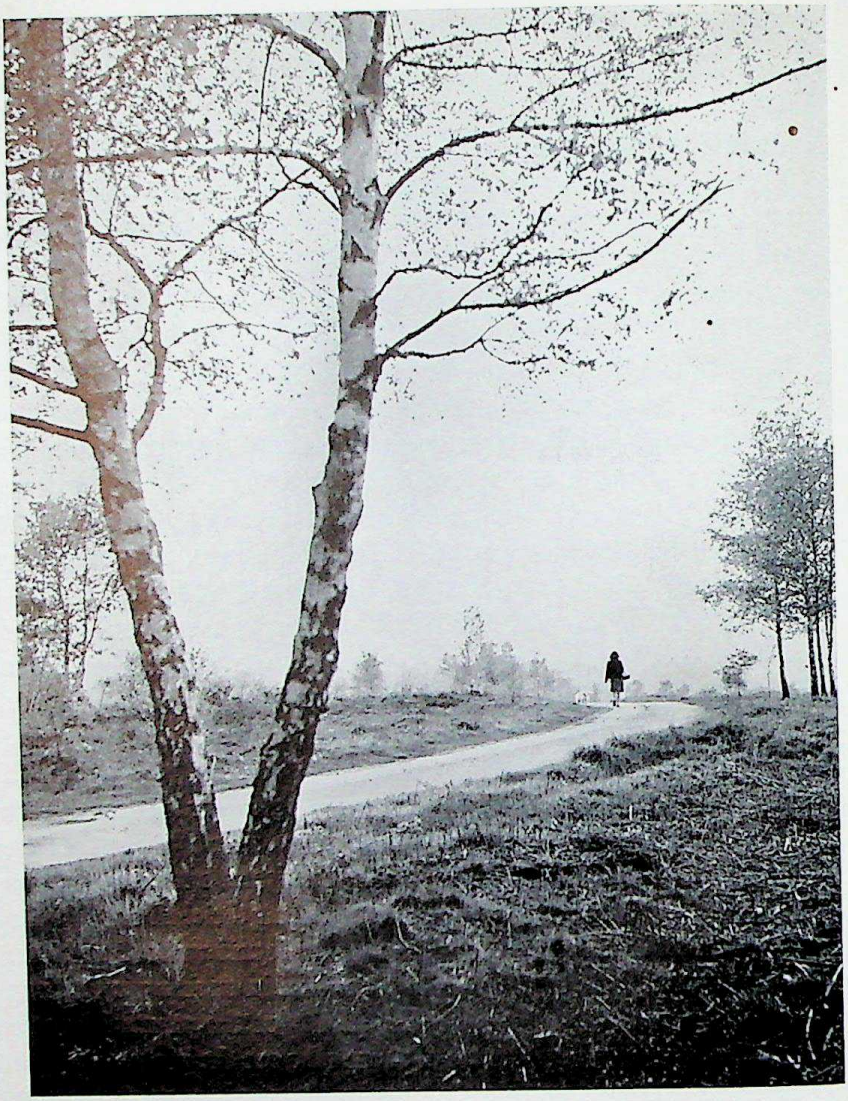

1. *The straight print*

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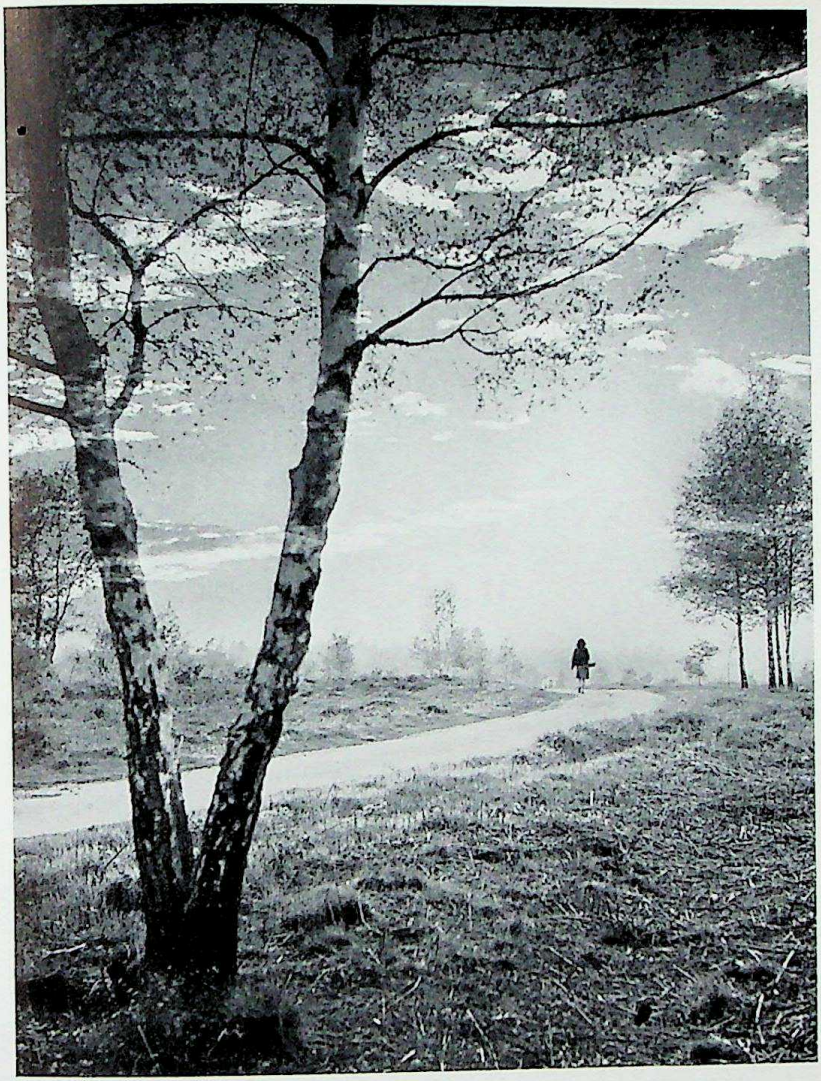

2. *Shows the effect of a new sky*
(*Note that afterwork to remove the sky pattern from the tree-trunks is still needed*)

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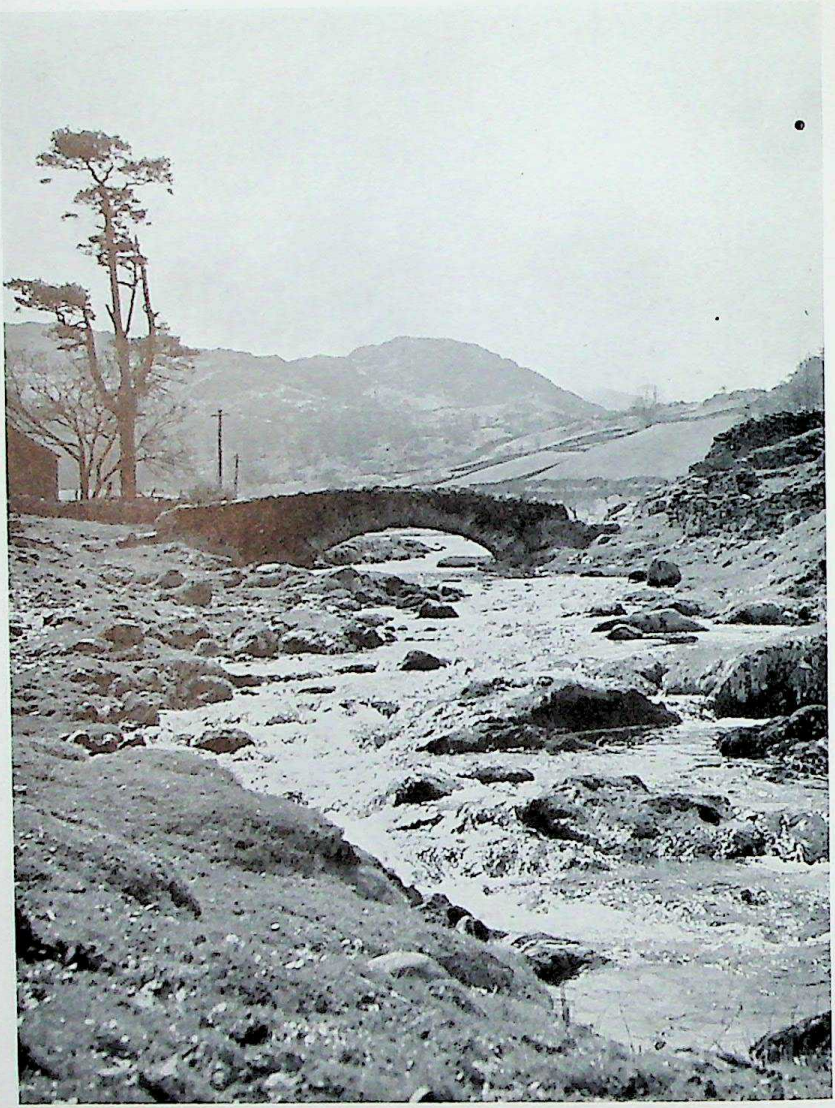

3. *Watendlath — straight print*

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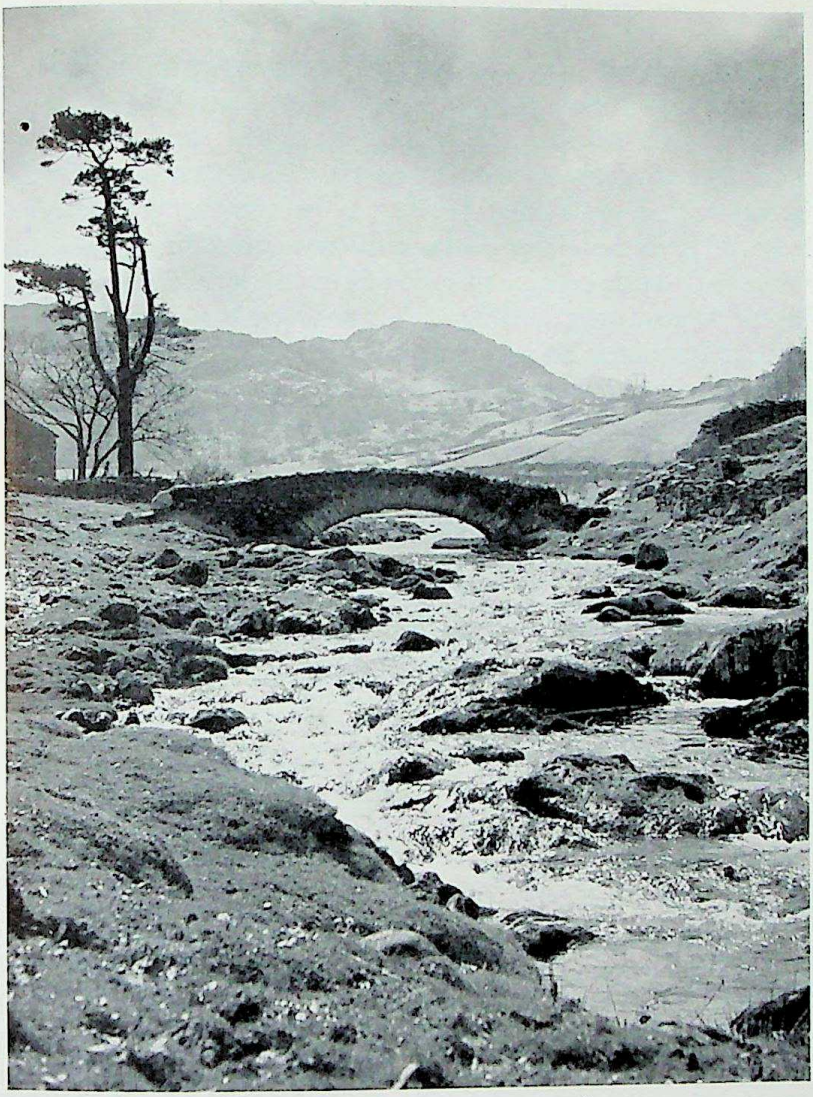

4. *Watendlath — after control*

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These processes also encourage self analysis, for if it is possible to make corrections, the print can be scrutinized to see what improvements can be made. If there is nothing that can be done about it, a critical examination which reveals defects is discouraging rather than stimulating. Further, a photographer with a knowledge of the control processes, need not abandon a promising subject in despair because irritating distractions spoil its unity, for he can remove them. Many a shot apparently ruined by poles, litter, or unsuitable backgrounds, has been taken, and transformed into what the photographer would like to have seen. It was a great relief to know when taking Plate 3 that the telegraph poles need not appear in the final print.

Opportunities for many shots occur on holiday when time is limited, but how often does the sky co-operate? The photographer with a file of suitable cloud negatives, and an interest in combination printing, need not scowl at the clear blue sky which delights his family, for in many cases he can add his own clouds.

The purpose of this book is to explain the application of the more valuable control processes. Those described are not stunts, they are essential factors in the creation of photographic pictures, and are techniques which the worker anxious to improve his results, cannot ignore.

Care and patience are needed; for the first efforts, particularly with chemical reduction, may well be disappointing — even ruinous; but this applies to the finer points of most creative work. The sculptor may wreck a potential masterpiece with almost the finishing blow, but this should not tempt him to leave it incomplete. The photographer will see many prints which have been spoiled by bad afterwork. He should not be discouraged, rather should he examine them carefully, to be able to recognize the faults, and so avoid them himself. For those with the patience to learn, *Print Control* offers new flexibility and power, and adds greatly to the pleasure to be derived from photography.

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2

# Control Before Printing

Prevention is better than cure — an old saying — and in the same way selection is better than afterwork.

Print control starts before the exposure is made, and a whole range of photographic techniques which are the subject of many books play their part. Since the real purpose of this book is to show how to control the making of a print, and the subsequent afterwork on it, to the greatest effect, this will be a short chapter of but general interest. Its principle value is to show that the control processes described are often used as a cure, and that a little thought might have made them unnecessary. It is a mistake to be careless when making the exposure, and to rely on afterwork to correct the faults, so let us consider what factors, when planning the picture, influence the print, or the work to be done on it.

In another chapter, print quality is discussed, and the way in which this is affected by the processing. But a quality print can never be made from a poor negative. To be good, a negative must have been both correctly exposed and developed. The serious photographer who wishes to produce good quality prints, should standardize his technique, so that he can be sure of producing a negative which is full of gradation — but not too soft. He should regard this as vital. Too many, particularly miniaturists, are side-tracked by factors of relatively little importance. They chase speed and fine grain in a never-ending circle. Each new developer is tried as it is introduced, in an effort to obtain a more favourable relationship between speed and grain. An extra $\frac{1}{2}°$ Scheiner is hailed with the greatest joy, the production of a 20 diameter grainless enlargement as the acme of perfection. But the negatives

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so made will seldom be consistent, so that the experience essential for good printing cannot be learned.

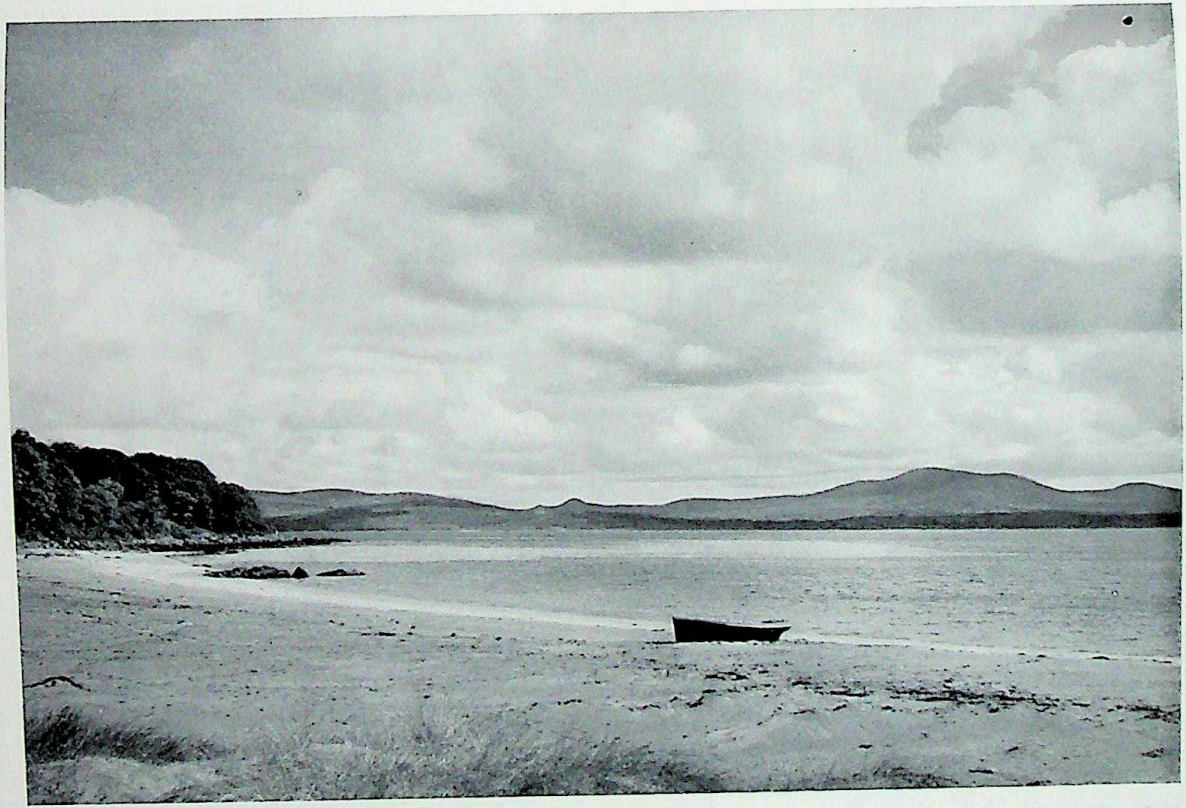
There are some branches, such as theatre photography, where extreme speed is vital, but for most subjects the modern camera man will find he has all the speed he needs. He should forget it, and he will find grain no longer a problem. But he should remember that fine grain by itself is no virtue. It is pointless to produce grainless enlargements above the size at which definition breaks down.

Speed and fine grain pull always against each other. Attempts to catch them unawares by using very fast film and superfine grain developer will not succeed, for much of the speed is lost in processing. The negatives are pale and thin, and can only make muddy prints. It is the film which has the greatest influence on the grain, and the miniaturist will find that for most of his work, the best combination is a medium-speed panchromatic film, and, dare I suggest it, the maker's recommended formula. It is great fun messing about with developers, but it is a temptation that has to be overcome, before first-class prints can be made.

Printing-in clouds is very interesting, and extremely useful at times. It is also rather difficult, so it is much better to avoid it if possible. This means that if the sky is appropriate, every effort should be made to record it as part of the picture. Plate 5 is such a case where it could be claimed that the sky makes the picture. An open foreground and distant landscape, so a short exposure prevented the highlights becoming over-exposed, while a medium green filter helped to provide contrast between the white clouds and blue sky.

At times the problem is not so easy. In Plate 16 the sky was good, but a short exposure was not possible because the foreground was relatively heavy, and needed more generous treatment. The solution was to give the full exposure for the foreground, and to over-correct the sky with an orange filter. Had this not been done, the addition of a new sky around the light-toned steeple would have proved very difficult. A few seconds' thought saved a lot of trouble in the darkroom.

Many of the best skies occur on windy days, when the clouds move rapidly, and the sky pattern changes every moment. How



5. *Lough Swilly*
*A print with 'control' before exposure*

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often do we shoot at the effect, possibly exhilarated by the conditions, without considering the composition, and when the print is made, find that the clouds don't quite fit? The boldest contrasts may be concentrated in one corner, or the subject which was to be outlined against the sky, fails to compel the attention which it should, because it merges with the background tones. Then either the picture has to be abandoned, or the clouds, lovely as they may be, have to be replaced by others which fill the space better. Similarly, if figures which affect the composition are moving, they must be watched and the critical moment of exposure related to their actions. With clouds, or figures, or any moving subjects which are worth photographing, it is wise to make one shot quickly in case conditions deteriorate, or the grouping breaks up, and then decide just what is the ideal arrangement and wait for it: but when a better chance occurs shoot again, for it is very seldom that the conditions will ever become perfect.

Telegraph poles, and the other paraphernalia of progress, can often be removed by careful retouching, but it is tedious work. Look for these eyesores when selecting the viewpoint, and try to lose them. Some things can be camouflaged, and I have several times been able to conceal a rather insistent notice reading 'Café' or 'Car Park', with a carefully draped mackintosh. We have come to accept pylons, poles, and overhead wires as symbols of our age, and at times they can be arranged into a powerful composition, in keeping with their purpose. In a village street or on a mountainside they usually conflict with the feeling of the scene, and in the interest of unity should be avoided if possible. It seems a pity that so many of our villages which are proud of their charm should permit such disfigurement. Sometimes a pole can be hidden by a tree, a wire blended into its surroundings, or a hoarding missed by moving slightly to the right.

Plate 36 shows that a foreground can be added to improve a picture, but it was a tricky business. No landscape is really effective without a good foreground, and it does pay to give some time to its selection. It will be the closest part of the picture, and the detail will probably show quite clearly. The rucksack left behind in the search for a viewpoint can no doubt be subdued with

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oil colour, but it would have been much easier to have moved it.

It is sometimes claimed that to the landscape photographer an axe would prove as useful an accessory as a filter. I am not advocating wholesale felling in search of views, but what the bird photographer calls 'gardening' is often worth while. The dead branch on the nearby tree can be removed by careful afterwork, but breaking it off is much better. So scan the foreground carefully and try to correct elementary faults before exposing.

Frequently the foreground is weak and needs to be strengthened by overprinting to provide stability, but there is a limit to the extent of such work if falsity is to be avoided, for it is not natural for a sunny path to merge gradually into deep shade. Look for shadows and try to use them, so that they throw a band of heavier tone across the base of the picture.

Occasionally, slight diffusion is very effective, but the result is usually more pleasing if applied in the camera rather than in the enlarger, which means, of course, that the photographer must visualize the treatment before the exposure is made.

Yes, a great deal can be done before exposing to avoid unnecessary afterwork. This does not mean that control can be eliminated altogether: but it can be minimized, and in some form or other it will always be of value in the production of a first-class print. Often the selection of a suitable paper grade, surface, or image colour is an important factor in control to obtain just the aesthetic effect desired. Indeed a good photographer should be able to visualize the print, and the treatment it is to receive, before the exposure is made. This is one of the greatest single factors contributing to a really outstanding print — that it was seen not just as a pleasant view, or a pretty face, but as a landscape or portrait interpreted in a particular way, before the camera was used.

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# 3

# Developing the Print

Although a whole chapter is devoted to this subject, it should be realised that in general the best results are obtained by following the manufacturers' instructions. Often photographers with little technical knowledge constantly produce fine quality prints, for they use one type of paper only, naïvely assume that the maker knows best, do what he says: and hey presto, it works!

For enlarging there are two types of papers in general use, bromides and chlorobromides. Much of the confusion which afflicts some photographers may well be due to the fundamental differences between them, because what is right for one, can be wrong for the other.

Chlorobromides are inherently much finer grained than bromides (yes, we have fine grain papers as well as films), and whereas bromides must be developed to finality, chlorobromides have more latitude, and development can be considerably curtailed without spoiling the quality. Bromides as normally developed produce only neutral blacks, whereas chlorobromides will yield a range of tones varying from sepia to black, the image colour depending on the influence of the processing on the grain structure. Their characteristic curves differ too, and chlorobromides tend to give rather better gradation in shadows and highlights.

## BROMIDE PAPERS

In general the only satisfactory colour a bromide paper will yield is a neutral black, and the full black is obtained only if the print is developed to finality, i.e. when all the silver salts which can develop out, have done so. This will take 2 minutes at 65°F. in either the MQ or Amidol developers normally recommended.

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Suitable general-purpose developers can be made up as follows:

| *Kodak D.* 163 | *Metric* | *Avoirdupois* |
|---|---|---|
| Metol | 2·3 gm. | 40 gr. |
| Sodium Sulphite (crystal) | 150 gm. | 6 oz. |
| or (anhydrous) | (75 gm.) | (3 oz.) |
| Hydroquinone | 17 gm. | 300 gr. |
| Sodium Carbonate (crystal) | 175 gm. | 7 oz. |
| or (anhydrous) | (65 gm.) | (2 oz. 260 gr.) |
| Potassium Bromide 10% solution | 28 c.c. | 1 oz. 65 minims |
| Water to make | 1000 c.c. | 40 oz. |

Dilute 1 part of solution with 3 parts of water.

| *Amidol* | *Metric* | *Avoirdupois* |
|---|---|---|
| Sodium Sulphite (crystal) | 50 gm. | 1 oz. |
| or (anhydrous) | (25 gm.) | (½ oz.) |
| Amidol | 5·5 gm. | 50 gr. |
| Potassium Bromide 10% solution | 12 c.c. | 100 minims |
| Water to make | 1000 c.c. | 20 oz. |

The solution is ready for use.

(The Amidol developer does not keep, and should only be made up on the day it is to be used.)

There are many other general purpose formulae published, and as stated before, the manufacturers' formula is always strongly to be recommended; but the two given are quite a valuable combination. D.163 gives decidedly more contrast than Amidol, and even brighter results can be obtained by using it at double strength, i.e. diluted 1 : 1 instead of 1 : 3. Occasionally with very difficult subjects, the steps between the paper contrast grades appear too great, so that the use of two such alternative developers introduces what is in effect a range of intermediate grades.

The time of development is related to the temperature of the solution, and if 2 minutes at 65°F. in an MQ formula is correct, the times for increased temperatures will be as follows:

70°F. : 90 seconds 75°F. : 60 seconds 80°F. : 45 seconds 85°F. : 35 seconds

These times are for development to finality — a little more will do no harm, but 2 minutes at 85°F. is equivalent to 7 minutes at 65°F., an extended time which would probably fog the print.

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No times are quoted for temperatures below 65°F., for at 60°F. and below, even extended development will not give a satisfactory result, because the hydroquinone content of an MQ developer (which gives the contrast), becomes almost inert, producing muddy prints. Amidol is slightly better in this respect, but if it is difficult to keep the temperature up to 65°F., the following developer in which chlorquinol replaces hydroquinone can be used:

| | *Metric* | *Avoirdupois* |
|---|---|---|
| Metol | 3·5 gm. | 60 gr. |
| Sodium Sulphite (crystal) | 80 gm. | 3 oz. 80 gr. |
| or (anhydrous) | 40 gm. | 1 oz. 260 gr. |
| Chlorquinol | 10·75 gm. | 190 gr. |
| Sodium Carbonate (crystal) | 175 gm. | 7 oz. |
| or (anhydrous) | 65 gm. | 2 oz. 260 gr. |
| Potassium Bromide 10% solution | 18 c.c. | 6 drms. |
| Developer Improver (Latitol or 142) | 36 c.c. | 12 drms. |
| Water to make | 1000 c.c. | 40 oz. |

Dilute 1 : 2 and on bromide papers give 3 minutes for temperatures between 60°F. and 65°F., and 4 minutes for temperatures between 55°F. and 60°F. It is equally good for chlorobromides, but as explained later, development times for these can be halved if required.

Although heating developer on a warming plate is relatively easy, keeping a large dish of solution at a constant temperature over a long period by such means is not. The area to be warmed is so great that uneven warming is quite possible, and the temperature of the developer will depend partly on how frequently it is agitated, how long it has been heated, and the ambient temperature. Since two hours or more may elapse between developing the first test strip and the exhibition print, the importance of having the developer at the same temperature throughout will be obvious, because the higher its temperature the less the exposure required for a given density. Many an over-dark print is due to the test strips being developed at 65°F., and the final print at 70°F.

The safest way is to maintain the room temperature constant. Obviously 65–70°F. is the ideal, but if at times this cannot be reached, it is better to allow the temperature to drop to a steady

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60°F. or even 55°F. and use the Metol Chlorquinol developer, rather than to risk temperature variations on an important print.

For small routine prints, of course, the dish warmer is ideal, and since both exposure and developing times are reduced with higher temperatures, much time is saved. The Metol Chlorquinol developer is recommended for use in cold weather for large exhibition prints, where even temperature over a long period is vital.

Occasionally it is possible to exercise slight local control when developing, equivalent to overprinting, if it is seen that an area has not become dark enough, or highlights are lacking in gradation. Such things should, of course, be covered by shading when enlarging, but they may be missed, and if as the print finishes developing it is realised that there is a weak area, the following process may help to save the picture. Pour off the developer, and rinse the print in plain water to stop the action. Drain off the water, and apply the developer to the area at, say, double or even treble strength, on a wad of cotton wool. The effect can be increased by breathing on the print or rubbing the developer on with the fingers.

The method is of principal value with bromide papers, for with chlorobromides, as development is extended, the tone becomes colder, resulting in uneven colours.

### CHLOROBROMIDE PAPERS

Above a certain grain size the silver of a print will appear a neutral black. Normally developed, a bromide paper will have a grain structure well above the critical size, but chlorobromides produce, even when fully developed, much finer grain, so that the image colour is slightly warm. The versatility of chlorobromides, and the wide range of colours they can give, are due to their not having to be developed to finality, and the effect of this on the grain size. Fully developed, a rich slightly warm black results, but, providing it is not overdone, they will respond without loss of quality, to nearly all the methods which promote fine grain, and which are so well known to the miniaturists, such as:

(a) Curtailed development.

(b) Dilution.

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(c) Increased restrainer.
(d) The addition of a solvent.
(e) Special fine grain developers, containing chlorquinol, glycin, etc.

Of the above (b) and (c) are of course seldom used for films, but when used on papers, serve to curtail development by slowing up the action.

The D.163 developer gives a full warm black with chlorobromides at 2 minutes at 65°F., but with one minute only, the tones will be appreciably warmer. With most types of paper the time should not be reduced below 45 seconds, or muddy prints will result. But such short times are not recommended, for when the print is removed from the developer it is darkening very rapidly. Not only does this mean that a difference of a few seconds will cause the print to be either lighter or darker than the test strips, but unless development both started and finished at the same instant all over the print, patches of uneven density will result.

This is where dilution and increased restrainer come in, and for warmer tones a developer such as Kodak D.166 is to be preferred:

| *Kodak D.166* | *Metric* | *Avoirdupois* |
|---|---|---|
| Metol | 2·3 gm. | 40 gr. |
| Sodium Sulphite (crystal) | 100 gm. | 4 oz. |
| or (anhydrous) | (50 gm.) | (2 oz.) |
| Hydroquinone | 17 gm. | 300 gr. |
| Sodium Carbonate (crystal) | 136 gm. | 5 oz. 220 gr. |
| or (anhydrous) | 50 gm. | 2 oz. |
| Potassium Bromide 10% solution | 250 c.c. | 10 oz. |
| Water to make | 1000 c.c. | 40 oz. |

Dilute 1 : 6 and develop for 2 minutes at 65°F.
(Increase to 3 minutes for colder tones.)

Note that the quantities of developing agents are the same as for D.163, but that the potassium bromide content has been increased 9 times, and the developer is only used at half strength. D.166 is in effect a more highly restrained and diluted version of D.163. It works more slowly, so that the 2 minutes recommended, and which would produce finality with D.163, represents considerably curtailed development, with the process under greater control.

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Further curtailment by yet more dilution, or restrainer, or by reduced development time, will produce still warmer tones, but with a tendency to lose quality. If brown colours are preferred, particularly with the faster chlorobromides, it is better to use one of the special extra-warm tone developers. The following is suitable:

| | *Metric* | *Avoirdupois* |
|---|---|---|
| Sodium Sulphite (crystal) | 25 gm. | 1 oz. |
| or (anhydrous) | (12·5 gm.) | (½ oz.) |
| Sodium Carbonate (crystal) | 25 gm. | 1 oz. |
| or (anhydrous) | (10 gm.) | (180 gr.) |
| Potassium Bromide 10% solution | 5 c.c. | 100 minims |
| Chlorquinol | 6 gm. | 120 gr. |
| Water to make | 1000 c.c. | 40 oz. |

Used at full strength for 2–3 minutes at 65°F. it will produce a rich warm brown. Again, even warmer tones can be obtained by halving the strength, but only at the risk of losing quality.

The pursuit of over-warm tones is a frequent source of muddy chlorobromide prints. There is little doubt that on these papers the best quality is obtained when the image colour is a rich warm black, and for the great majority of subjects little is gained by striving for browner tones.

Because a warm-tone chlorobromide is capable of further development when it has reached the correct density, it is necessary to be very careful in the processing if patches of uneven density are to be avoided. Operations on the following lines are to be recommended:

Expose the test strips in the usual way, and assuming that D.166 is being used, start the darkroom clock as they are placed in the developer. At precisely the predetermined time remove them, rinse quickly, and drop them in the hypo. After about a minute, switch on the light and examine them. Picking the correct density is not easy, and as explained in Chapter 7, allowance should be made for their drying darker. If the colour is not satisfactory, it is at this stage that experiments with developers, dilution, restrainer, etc., should be made, and a note kept of all the conditions, so that they can be repeated exactly on the print. When test strips of the right

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contrast, density and colour have been made, it is time to make the print.

It is much easier to flood the whole of a large sheet of paper with developer, if it is wet first; so after exposing, immerse the paper in clean water at the same temperature as the developer for about a minute. Pour off the water and flood the print with developer to which wetting agent has been added. Do not allow all the developer to fall on one small portion of the print, sweep the measure containing it in a smooth rotary motion over the surface, so that it is dispersed. Keep the dish rocking, and make sure that all the print is flooded regularly. At about 5 seconds before time is up, lift it out to drain for a second or so, give it a quick rinse, and then immerse in the fixer.

Many chlorobromides go wrong at this stage. The danger is, that weak or insufficiently acid fixer, or only partial immersion of the print in it, may leave pockets of active developer trapped in the emulsion. For a bromide print where all the silver salts which could darken have done so, i.e. development to finality, this will not matter, providing that the white light is not switched on too soon, but with a warm-tone chlorobromide it does. Remember, if the print had been left in the developer it would have continued to darken, so if developer is left in parts of the print, the same thing happens, it goes on darkening, and the print shows odd patches of extra density.

If this is to be avoided, it is essential that the effectiveness of the developer shall be destroyed simultaneously all over the print, so that the rinse should be brief, the fixer acid, and the print agitated in it for at least a minute, and even after that, care should be taken to ensure that the whole of the print remains fully immersed for a further 2 or 3 minutes. Alternatively, a stop bath of $2\frac{1}{2}\%$ solution of potassium metabisulphite may be used between developing and fixing.

Too many photographers regard the versatility of chlorobromide papers as their principal merit. It is possibly their greatest disadvantage, because it encourages slovenly work, as they will produce some sort of print however they are handled. For the best results, however, it is necessary to know how they react to the

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various treatments, and let me risk repeating it once again, to control each factor so that the appropriate conditions for a particular result can be duplicated exactly.

Since the composition of the developer exercises considerable influence on image tone, the manufacturers' formulae are even more strongly advocated for chlorobromides. Some of these papers are very particular in this respect, and if the results do not please, it is well worth trying the makers' recommendation.

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# 4

# Projection Control

The afterwork required on a print, depends on how it departs from the photographer's conception of the desired result, to tell its story with the greatest effect.

The object when enlarging should be to do as much of the control as possible, for this will tend to improve the quality. It is important to realise that projection control and afterwork, each play their own particular part, and above all, that later work on the print is seldom successful in covering up poor enlarging technique.

When it has been developed, fixed, and washed, the print should need only those processes which are best done afterwards. If the clouds are still weak in that landscape, don't be persuaded that oil reinforcement will cover up the deficiencies; make another print, and give the sky more exposure.

## SHADING

This chapter is devoted to the simpler enlarging techniques, and of these the most useful is shading, in which local areas receive more or less exposure than is given to the rest of the print, to render them darker or lighter than they would be if no control was exercised. There are two fundamentally different reasons for this work:

(*a*) To improve the composition by printing up such areas as foregrounds, to provide stability, and toning down distracting parts to simplify the design, and concentrate the attention on the centre of interest.

(*b*) Because the tonal range of the negative exceeds that of the paper.

The first is a case for careful analysis of a trial print, to decide just

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what areas need such attention. Very few are able to assess the full possibilities of a subject, and how it should be treated to exploit them, from a cursory glance at a small proof. It is better to progress slowly. Make the first prints from a fresh batch of negatives, as straight enlargements from the whole negative, on the appropriate grade of paper. Postcards are convenient for 35 mm. negatives, $3\frac{1}{2}$ in. square for $2\frac{1}{4}$ in. square negatives, while bigger negatives will provide contact prints. Study the results carefully, show them to friends, invite criticism, and learn to know them. Few prints, unlike people, improve with knowing, and within a week most of the proofs having lost their freshness, and possibly the power to evoke memories, will no longer appeal. Those which survive this critical period promise well, and should be examined to see how they may be improved.

Even the most advanced workers find this self-analysis of their work very difficult, but it is a faculty which every photographer must seek to develop if progress is to be made. The secret lies in trying to function as a disinterested critic, and to imagine that the work has been done by someone else anxious for assistance. It is easy when confronted by others' prints in a portfolio, to see what is wrong — or so we think — but our personal interest in our own prints tends to blind us to their shortcomings.

Firstly, study every possible variation of trimming with a pair of L-shaped cards, and mark the verdict on the print. Examine the composition within the new format, noting the improvements that can be effected by local shading. Then make a whole-plate version, several if necessary, until the effect desired has been achieved. I keep a book in which I record details of all such prints, making a very rough diagram of the subject which shows the nature of the shading, and noting the grade of paper, type of developer, and the illuminant used in the enlarger. Sometimes the shading may be quite comprehensive, so that the sketch shows the way in which the masks were handled.

Repeat the analysis on the whole-plate print, prop it up on the mantelpiece, and live with it for a while. After a week or so it will either lose its appeal, or survive as the basis for an exhibition picture. If it does, the time spent considering it, and the data in the

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notebook, will be of great value when making the big print. This print is to be something special. The amateur to whom photography is a spare time hobby will be fortunate indeed, if throughout the year a dozen negatives merit such attention. So devote the whole of one darkroom session to the task. Don't hurry it: think of nothing else until the job is finished; the shot of the little boy next door cannot be sandwiched in somewhere. Try to approach it with something of the inspiration which fires a painter, when a fine subject is responding to his touch.

Finally, make at least two big ones, because one is usually better than the other, and it is often the second, as indeed it should be. Then if one is spoilt by the afterwork — and who does not breathe more freely when the 'ferri' bottle is replaced in the cupboard? — there is still another one left to ruin! Plates 6, 7, 8 and 9 show two examples of carefully planned shading, to strengthen the composition.

A negative being viewed by transmitted light, can show proportionally a much greater brightness range than a printing paper, which, viewed by reflected light, is limited to the difference between the amounts of light reflected from the white paper, and the deepest black. On fairly uniformly-lit subjects, the negative brightness range will be within the scope of the paper; on very contrasty subjects, even the range of the negative may be exceeded. In many cases, the brightness range of the negative can only be accommodated on a straight print by using a soft paper, and this may lead to a lack of quality, particularly in highlights and shadows, when compared with a print made on a harder paper, on which the tones in areas where they would normally be lost, have been preserved by local shading.

I hope those who dislike graphs will pardon a technical digression while I try to explain why. Fig. 1 shows the D log E curves for two different grades of paper. If the same increase in exposure were accompanied by the same increase in density from extreme highlights to deepest shadows, the 'curves' would be straight lines, and not flattened 'S' bends. The steeper the gradient the greater the increase in density for a given change of exposure. The curve has a fairly straight middle portion, and a pronounced toe and knee,

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which means that in the middle tones, contrast is greater than in highlights or shadows. It will be seen that curve 'A' is steeper than curve 'B' throughout all its length, so that the hard paper will give greater contrast than the soft, not only in the middle tones, but in the highlights and shadows also, where inherently it is less.*

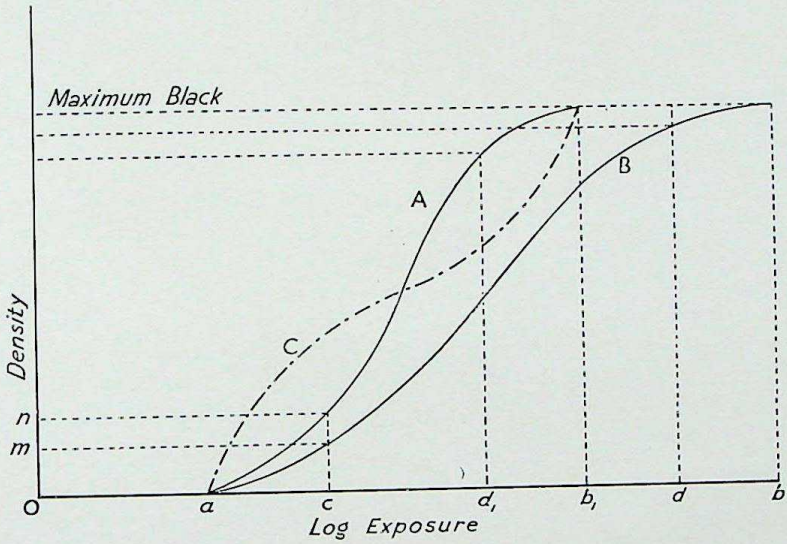


*Fig. 1. D log E curves for different grades of paper*

To compensate for the decreased contrast at the extreme ends of the scale, it would be necessary for the negative material to have a curve like 'C', i.e. for the negative contrast to be greater at the ends than in the middle of the curve: but the negative D log E curve is fundamentally the same as the paper curve, except that the straight-line portion is straighter and longer, and the knee and toe appear only in the regions of over, and under exposure. Clearly any exposure which places important tones in these regions, aggravates the problem.

*The curves should, of course, be displaced, because the speeds of different grades of paper differ, but for the purpose of the argument this is ignored. The explanation is in fact, only in general, and not very accurate terms, and the technically minded, who are interested in the problem, are strongly advised to consult some of the more advanced photographic text books.

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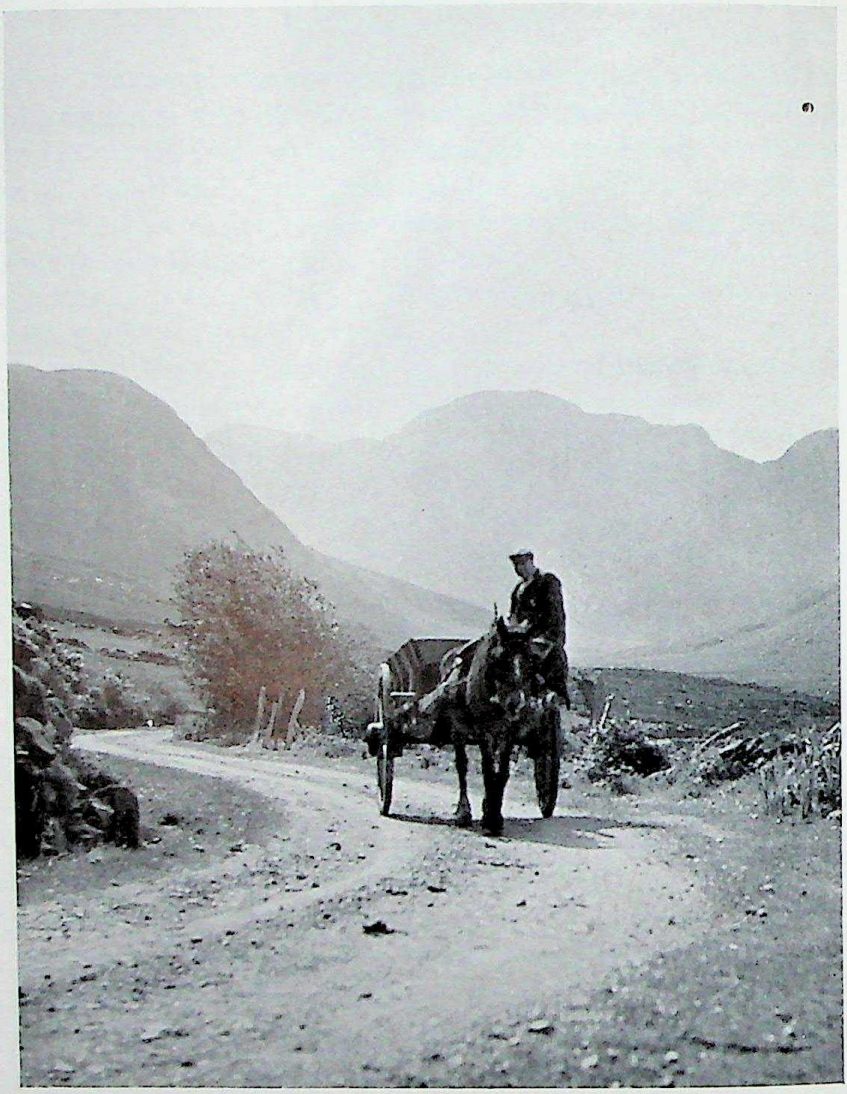

6. *The Hills of Donegal*

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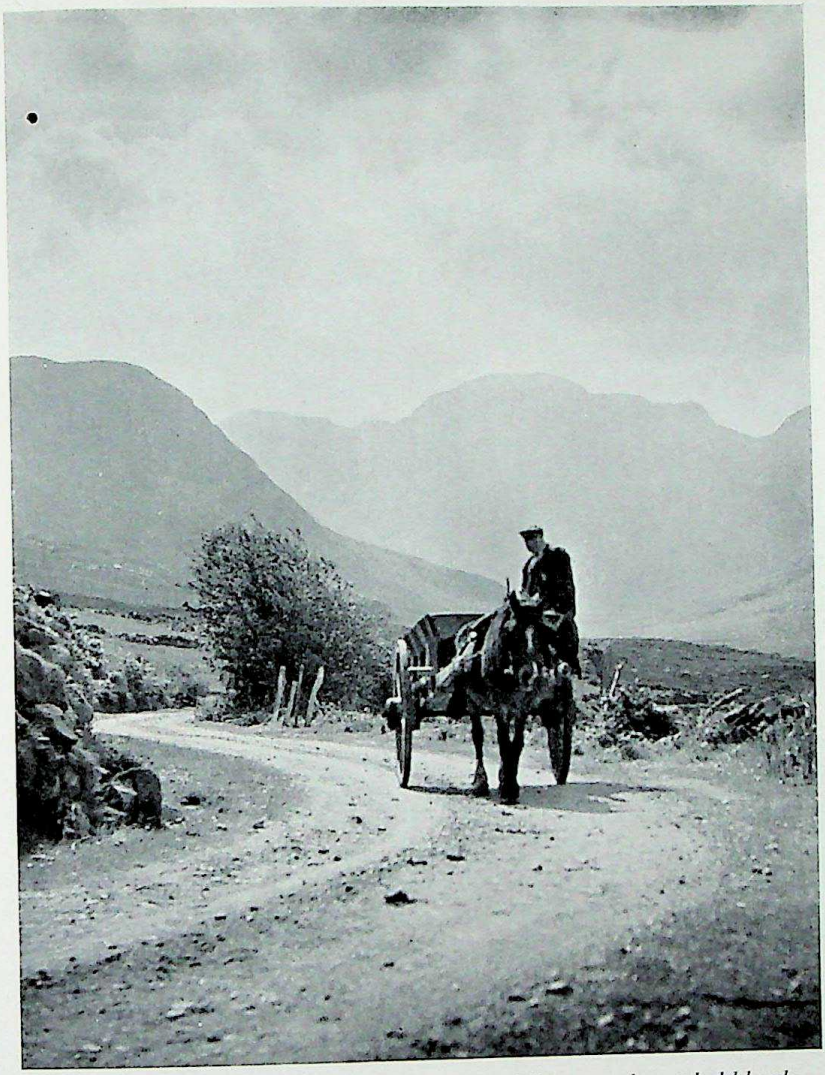

7. *With foreground and sky printed up and figure and cart held back*
*See Fig. 3 for details*

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8. *Taken after sunset, the straight print lacks realism*

9. *Shows the effect of printing up the sky*

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Suppose the brightness range of a negative is such that the paper is subjected to exposures from (a) to (b) when the negative is projected in the enlarger. The whole range of exposures is within the range of the soft paper in that each exposure increment within (a) (b) produces an increase in density, whereas between ($b_1$) and (b) there is no such effect on the hard paper, because at ($b_1$) the shadows are already as black as they can be, and no further increase in exposure will make them any blacker.

But look at the other end of the scale, the highlight exposures (a) (c) will produce a density difference of (o) (m) on soft paper, and (o) (n) on the hard paper. Thus the differences in the densities of the highlights in the soft paper, are less than in the hard, and the effect is that they appear less brilliant.

Now in a subject such as is shown in Plates 10 to 13 there are two approaches; either to accept the result on the Grade 2 paper where none of the tones are lost — and which is the obvious and lazy solution — or, observing the improved quality which can be obtained in the sky with the Grade 3 paper, see if there is not some way in which the shadows can be prevented from blocking up, while the highlights are printing. It's obvious, isn't it? We resort to shading, and in the process ultimately produce better shadow gradation than on the Grade 2 paper; for referring again to Fig. 1, the effect of holding back the shadows, is to reduce the exposure given to the area denoted by (d) (b) to ($d_1$) ($b_1$) and the density range produced on curve A by exposure range ($d_1$) ($b_1$) is greater than that produced on curve B by (d) (b), so the shadows increase in contrast, and thus in quality. See also Plates 14 and 15 for a similar case.

I have dealt with this in some detail, because print quality, which after all is an important factor in appeal, is a very elusive attribute, which I believe for many subjects is closely related to the grade of paper used, and the method of handling it.

This does not necessarily mean that harder papers are better for all subjects. For many the emphasis is not on brilliance, but on subtle tones, and the paper grade must be selected carefully to avoid building up excessive contrast, and destroying the effect.

Only experience can tell the photographer which approach is

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10. *Print on Grade 2 paper*

11. *Print on Grade 3 paper exposed for foreground*

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12. *Print on Grade 3 paper exposed for sky*

13. *Print on Grade 3 paper shaded as shown in Fig. 3*

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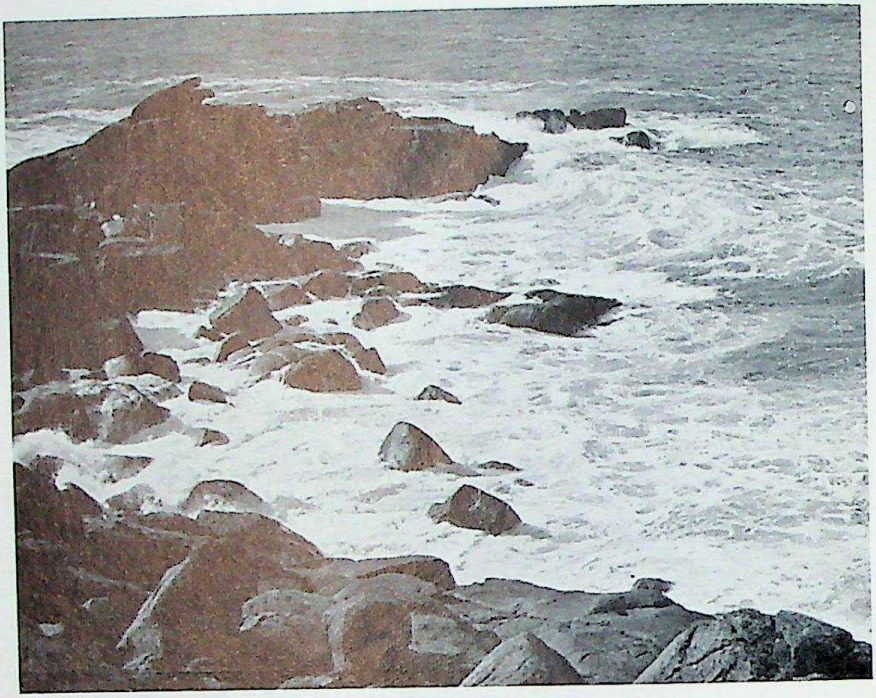

14. *Straight print — note heavy shadows*

15. *Print with shadows held back*

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appropriate, but if the subject is one which calls for brilliant photographic quality, it is always worth considering if a better print could be made, by using a grade harder paper, and shading any areas which are outside its range.

In practice, the curves for different makes and types of papers vary considerably, so that one paper may give better shadow gradation than another, which produces superior highlight quality. To obtain the best possible print quality, it is advisable to study these factors, and to try to assess the characteristics of the various papers on the market. To become familiar with one paper and developer, is a very sound maxim for the beginner, but having done so, to acquire a knowledge of a range of papers, extends the scope of the work that can be tackled. Selecting the right type of paper, and knowing how to use it, are big factors in the production of quality prints.

Generally there should be gradation in all the tones of a picture, i.e. no appreciable areas of jet black or pure white. But this is not a hard and fast rule, for again the photographer must use his discretion. It is the effect that matters: the story which the picture tells, and he may have to decide how much tone value to sacrifice for it. In sunset studies, for instance, the brightness ranges between the glowing sky, and the dim foreground may be too great even for the negative. In Plate 9 it might have been possible to obtain a suggestion of tone by shading the foreground, or by using a softer paper, but this would have reduced the luminosity in the sky, which is derived largely by contrast with the foreground.

Having examined the reasons for shading, let us consider how it is done. To print up a particular area, a piece of card or opaque paper, must be interposed between the lens and the sensitive paper, so that the projected image is obstructed elsewhere. The card must be kept moving gently to prevent a hard line appearing — how much, will depend on the nature of the area: it may oscillate over a quarter of the print or more for a sky or foreground, but $\frac{1}{8}$ in. only for the clearly defined shape of a white-washed wall. Obviously the latter case presents more difficulty, and the amount of additional exposure is limited if curious effects at the margins of the controlled area are to be avoided.

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To hold back a part of a print, normally shadows, or perhaps distant hills to improve recession, the procedure is reversed. If the area runs into the edge of the print, the hands or fingers can often be used as very versatile masks, but if it is isolated within the print,

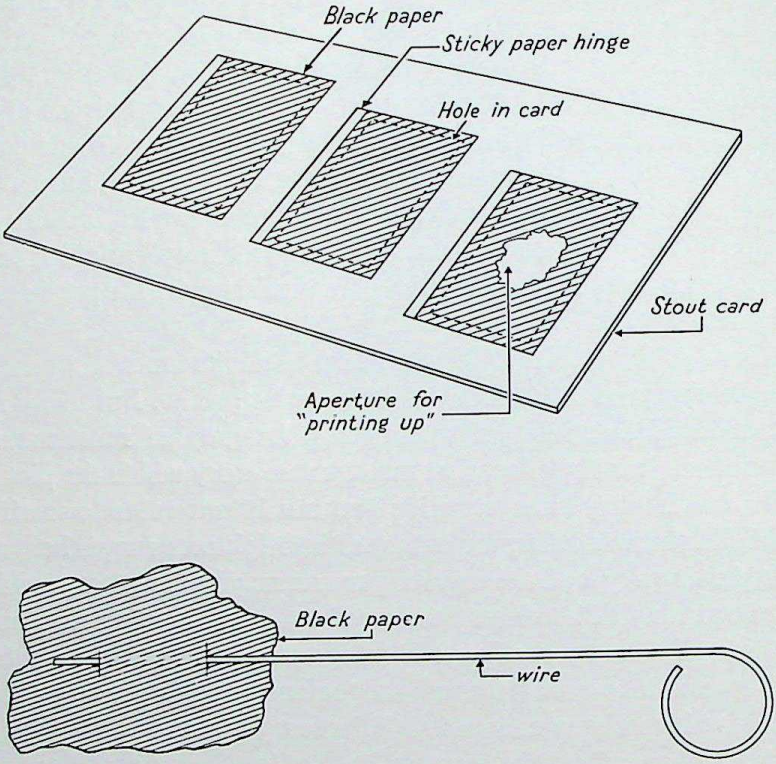


*Fig. 2. Dodging devices for local shading*

the mask must be supported on a piece of thin wire. The movement will prevent the shadow of the wire from affecting the print. (See Fig. 2.)

Once experience is gained, this becomes one of the most fascinating aspects of enlarging, and I sometimes wonder what the uninitiated would think, if they could see me apparently casting mystic spells over my bromide paper.

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There are a few wrinkles though, even in this fairly simple technique. For instance, be sure that the masking paper really is opaque, or the light filtering through will degrade the print: the black paper in the bromide packet is quite suitable. It is not necessary for the mask to be close to the print if the shading is broad, and a piece of 12 in. by 10 in. card can easily be used to print up the sky on a 20 in. by 16 in. print, if it is held midway between the print and the lens.

Don't try to make a set of 'dodgers' with stereotyped shapes; cut out the mask wanted for the job. For printing up local areas it is a good plan to cut some holes in a large sheet of cardboard, and to cover them over with flaps of paper. The correct shape can be cut in one of the flaps, which can afterwards be replaced; thus saving the card for subsequent operations. (See Fig. 2.)

On a big print to be subjected to complicated masking, it pays to consider the sequence of operations and to design the masks so that they overlap if necessary to reduce the number needed. Fig. 3 which gives extracts from my notebook shows the masking applied to Plates 7 and 13. Each wavy line shows the travel of the mask, and the extra time is given in the circle at the end of it. It will be seen that by allowing the masks to overlap, a wide variety of different exposure times can be produced.

The amplitude of the wavy line indicates the travel of the mask, and this can be very important. Note the way in which the sky of Plate 7 has been printed up. If all the additional 13 seconds for the sky had been applied over the boundaries of the line marked 'A', the difference between 10 and 23 seconds would have been spread over too narrow a band, resulting in a halo effect round the mountains: but if the shading is too broad the base of the sky may remain weak. Clearly if the sky is to be appreciably overprinted, the result is bound to be somewhat false, and in such cases it is advisable to examine the effect on good-sized test strips. A slight haloing as shown in Plate 7 is inevitable, but can often be largely eliminated by careful afterwork in the form of oil reinforcement, which extends the pattern of the sky into the weaker band. It might be thought that the halo could be avoided by lowering the mask, but if this is done, the edge of the hills would be darkened;

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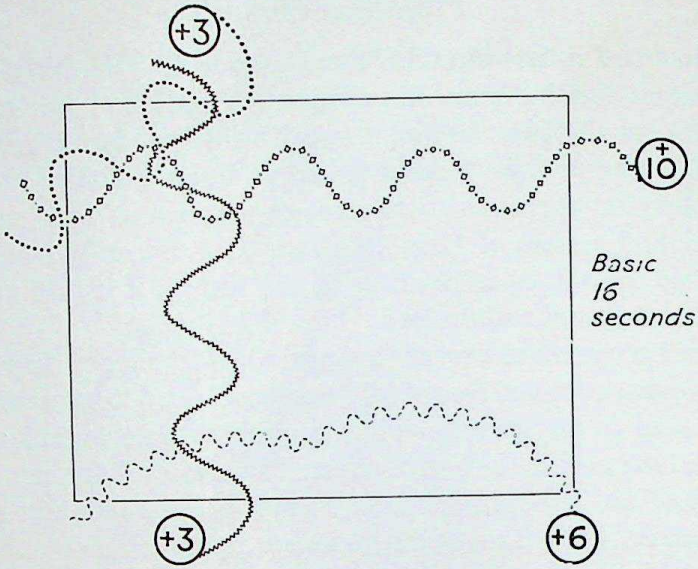
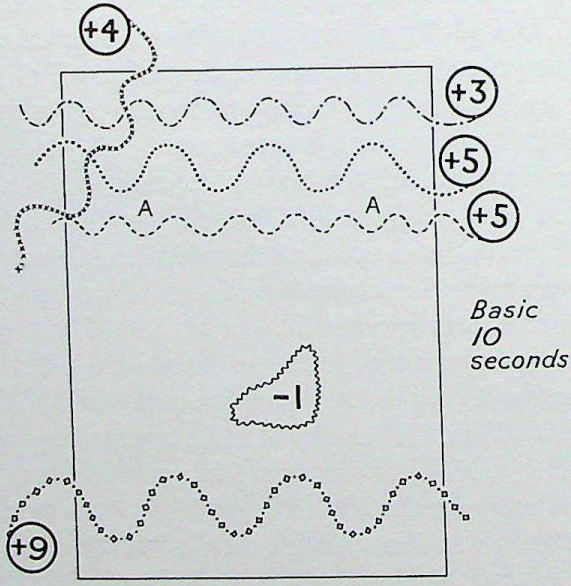



*Shading record for Pl.* 13




*Shading record for Pl.* 7

*Fig.* 3. *How to keep records of shading applied to prints*

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an unnatural effect, much more difficult to correct subsequently. These principles apply to other areas besides the sky, and test strips are valuable wherever the effect of the shading cannot be correctly predicted.

A rehearsal is almost essential if complex shading is to be employed; placing the masks so that they can be applied in the correct sequence, and running through the operations until they are known by heart. It is impossible to watch a clock and the masking at the same time, so it is advisable to count seconds from an audible signal. Accuracy in timing is essential for good work, and impatience or anxiety are almost certain to frustrate attempts to dispense with such a guide. Failing a metronome, some small clocks tick 4 times to the second, and once the rhythm is picked up, counting becomes quite automatic; it is a pity that so many clockwork darkroom timers are not designed to provide such an elementary facility.

There is still another form of shading often called 'flashing', which is sometimes useful for subduing an area where additional printing would tend to build up excessive contrast. It is in effect deliberate fogging, by removing the negative and allowing the enlarger light suitably stopped down, to play on the selected area. The value of this technique is described more fully in the chapter on oil reinforcement, which achieves much the same object.

The advantages of flashing over oil reinforcement are obvious, in that the added tone being photographic the problems of colour and texture matching, which are so troublesome with oil, do not arise. Against this it is not easy to assess the effect of flashing from test strips, for the amount of degradation which can be accepted is limited; and it is only applicable to fairly broad areas. With oil reinforcement the correct degree of fogging can be found by trial and error, on a full-size dry print in a good light, and the most complicated areas can, with care, be treated without affecting their surroundings. But I may be prejudiced as I rather enjoy oil reinforcement.

### DEFINITION AND DIFFUSION

Although some prints — but not many — are improved by

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diffusing the image, for the majority, good overall definition is a distinct advantage, while for a print to have immediate eye appeal, because of its brilliant quality, it is vital. It is folly to use a camera with a highly corrected anastigmat, and to enlarge the negatives it produces with an old rapid rectilinear.

It is frequently claimed that definition is not affected by the nature of the illuminant, but there is no doubt that in texture subjects, such as furry animals for instance, the added contrast between adjacent hairs produced by using a small concentrated

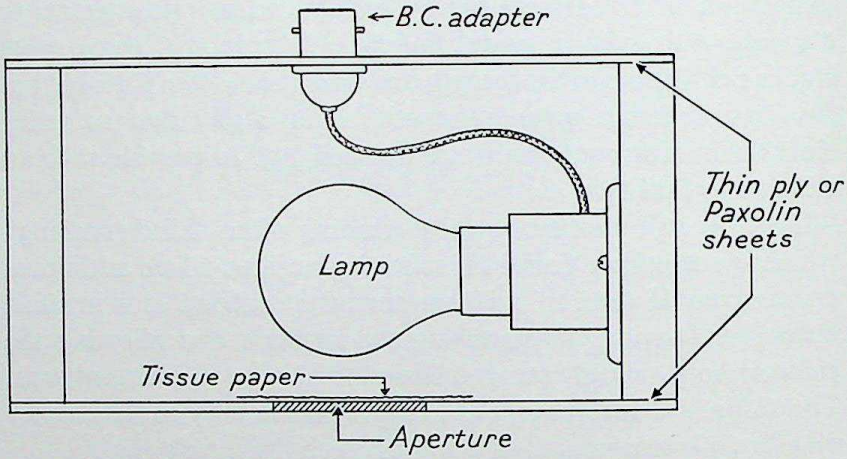


*Fig. 4. A concentrated light source for the enlarger*

light source, certainly gives the effect of crisper definition. Changing from an opal to a pearl lamp will result in quite a noticeable increase in contrast, but it may be difficult to obtain even illumination with the pearl lamp, because the light source is in the shape of a horseshoe, and the gap tends to throw a dark patch on the baseboard. Fig. 4 shows how a small projector lamp may be used. It will normally have to be mounted on its side, because such lamps are designed to distribute most of their light in two sectors at right angles to the axis. A motor car headlamp run off a transformer is ideal. The disc of tissue paper diffuses the filament just sufficiently to destroy its pattern, so that the light source is an

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evenly illuminated area of about ½ in. diameter. If this patch of light is accurately focused on the lens, illumination will be quite even, and as nearly all the light passing through the negative is used, surprisingly bright. This light system, in conjunction with a bloomed enlarging lens, will give the maximum resolution and contrast of which the negative is capable, and is of great value in enhancing the effect of texture. Unfortunately, it will also show with extreme clarity, the tiniest scratch or hair, and, alas for the miniaturists, the grain structure of the image!

For the great majority of cases the versatile opal bulb is by far the best illuminant, but just occasionally a subject arises where the smaller light source does produce a worth-while improvement.

At times the reverse is the case, and slight diffusion is an advantage in creating a particular aesthetic effect by concentrating on tone masses and suppressing detail. It is also of value in hiding grain, and for this purpose diffusing the light source by placing a sheet of opal or ground glass over the condensers, may prove sufficient.

Greater diffusion is provided by an optical device placed over the lens, to throw out of focus only a portion of the light emerging from it. The image will then consist of a core of crisp definition, surrounded by an ill-defined halo, the extent of the halo depending on how much and in what proportion the light is thrown out of focus. This sharp core is essential if quality is to be preserved, and gives a totally different effect to throwing the lens out of focus, when all the image is blurred. Diffusion discs, which are formed of concentric rings of clear and rimpled glass or celluloid, can be purchased, but much the same effect can be obtained by stretching a cross of cellophane in front of the lens. The amount of diffusion will depend upon the proportion of light affected, and clearly, stopping down will increase the effect, because as the lens area becomes smaller, a relatively greater proportion of light will be scattered by the cellophane. (See Fig. 5). A slight degree of diffusion is produced by stretching a piece of chiffon over a frame just below the lens, the effect being obtained by a portion of the light being diffracted by the fine mesh.

It is unwise to introduce much diffusion when enlarging,

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because then the darks spread into the lights, and produce a sombre effect, whereas diffusion when taking, spreads the lights into the shadows, and imparts a shimmering quality which can be most appealing.

Diffusion is sometimes more effective if applied to part of the print only. By projecting the foreground crisply, and the distance through chiffon, recession can be suggested by the simulated haze.

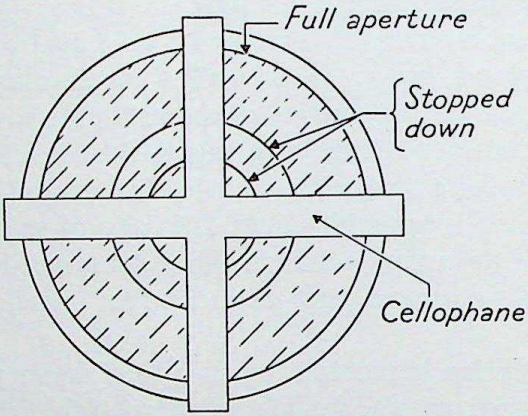


*Fig. 5. A simple diffuser*

CONVERGING VERTICALS

Many of us do much of our work with a general-purpose camera, which has no rising front, and needs to be pointed upwards if the tops of high buildings are to be included in the negative. This leads to the verticals converging towards the top, so that the buildings appear to be falling backwards. It is sometimes contended that this effect is quite natural: railway lines converge due to perspective, why not the sides of buildings viewed from below? The answer I think lies in the shape of the print. The sides do not converge, so that the verticals appear to fall away from the frame. There is no doubt that however many diagrams one draws to prove that converging verticals are right, they don't look right in a conventional-shaped print, and it is far better to forget theory and conform to general practice.

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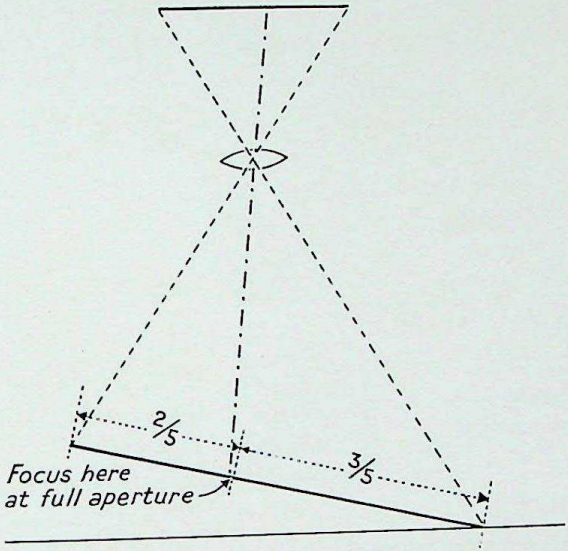
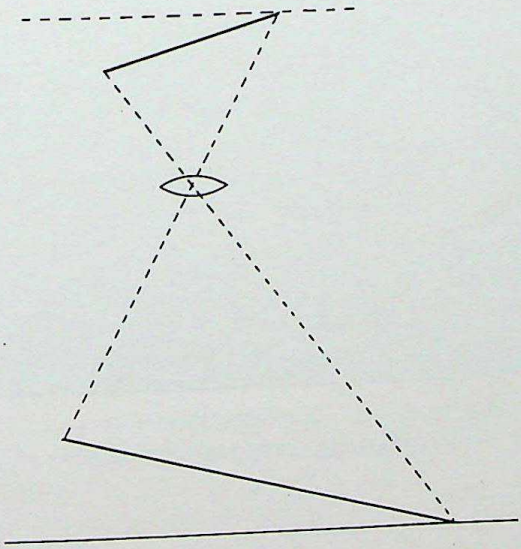



*Shows where to focus if only the paper is tilted*



*To restore overall focus, tilt negative as shown*

*Fig. 6. The correction of converging verticals*

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16. *Petworth*
*Showing converging verticals*

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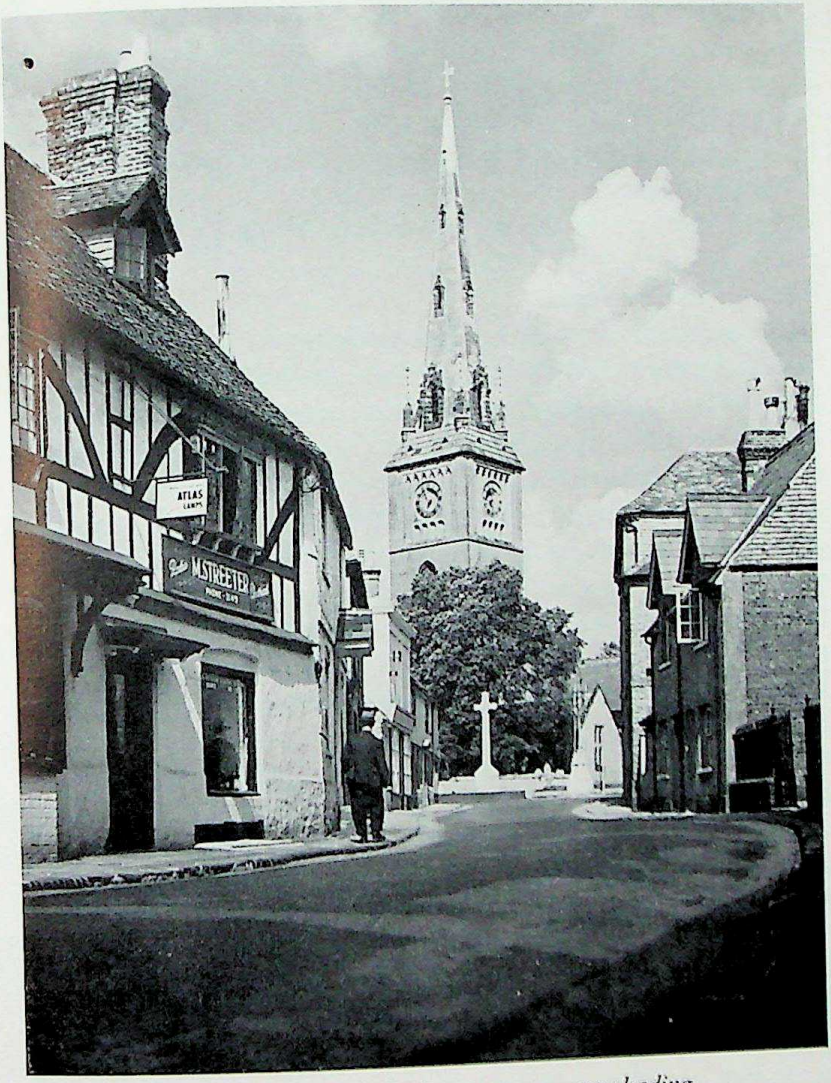


17. *Printed with 11° tilt on paper — no shading*
*Note relative densities of foreground and sky compared with Pl. 16*

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The verticals can be restored to parallelism by the simple expedient of tilting the sensitive paper, so that the base of the picture is nearer the lens than the top, until the decreased magnification balances the converging effect. This may be checked by laying a pair of straight edges along prominent vertical lines, and adjusting the paper until they are parallel.

Since the base of the picture is now closer to the lens, two results follow:

(*a*) It is out of focus.

(*b*) It receives more exposure than the top.

The closer any part of the paper is brought to the lens, the further from the lens the relevant part of the negative would have to move for it to remain in focus, which means that the overall focus can be restored by tilting the negative as shown in Fig. 6. Few modern enlargers are equipped with this facility, in which case the best compromise is to focus on a point two-fifths from the top of the picture, with the lens wide open, and then to stop right down, when the greater depth of field will make top and bottom reasonably sharp.

If the additional exposure given to the base matters, it is quite simple to rectify by shading. That the effect is detectable will be seen from Plates 16 and 17 where the corrected version is heavier at the base and lighter in the sky than the straight print.

The reverse procedure applies when the camera has been pointed down. The verticals diverge, and it is the top of the print which has to be lifted.

It should be noted that while the verticals are made parallel again, the exact proportions of the building are not necessarily restored, it may appear taller or shorter than it should be. Various methods have been devised for eliminating this distortion, but they are rather complex, and the eye is so accommodating that, providing the tilt has not been excessive, the deception is not noticed.

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# 5

# Combination Printing

This is one of the most fascinating branches of photography. It requires skill and ingenuity, and will encourage the waste of many sheets of paper striving for a particularly elusive effect, but it is well worth while.

This chapter is devoted mainly to the addition of suitable clouds on an outdoor subject, although a method is also shown in which other alterations can be made, and which has almost unlimited scope.

It is true that many astonishing effects can be created, by copying a composite picture built up by pasting together selected parts from photographic prints, but such work is more for amusement than for serious photography. Some very clever results have been obtained on these lines, and it is of course the method whereby the heads of celebrities are made to appear on the shoulders of lesser mortals, and often indulging in quite incongruous pursuits.

It might be imagined that the great versatility of such a process would be invaluable to the pictorial photographer, and that it could be used to produce artistic, as well as bizarre effects, it being no more difficult to put a horse and cart where it is wanted in a field, than to show W. G. Grace conducting a dance band. But it is too easy, so there must be a snag; and that is loss of quality in the process; for in copying, the gradation in the lights and shadows at the ends of the scale is bound to suffer. This is the toe and knee effect of the characteristic curve again. Since first-rate quality is of paramount importance to the serious photographer, the system is not often used as an exhibition technique.

So resisting the temptation to delve into such an intriguing facet

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of the hobby, let us consider a much commoner technique, the addition of appropriate clouds in a landscape. Even the fairness of these tactics may sometimes be queried, and I am afraid some photographers rather ask for it by emphasizing what they have done.

There is, of course, no question of fairness; the criterion is, has it succeeded? Could such a scene have existed, or has some falsity been introduced which observant folk would detect? If they are satisfied, it is successful; if they frown slightly, and query the lighting, it has failed; but if it is undetected by another 'skymonger' it is good indeed — for they are the most critical of all.

The technique is important, because for the composition of a landscape to be really effective, the sky must play its part. It must provide tone and shape. Tone, because if it is blank white it will effectively kill any highlights in the foreground. Shape, because if composition is defined as the arrangement of tone masses and lines so that the resulting pattern is pleasing to the eye, it is obvious that these qualities must exist throughout the picture.

Adding the right clouds calls not only for skill when enlarging, but a true sense of feeling. It is not just making a combination print like Dr Grace conducting the dance band, it is a means of expression, and as such it is only likely to succeed when practised by those who really love the country, and study nature in all her moods. It is no good just running through negatives, and printing on the first billowing mass of cloud that is found. A cloud negative must be selected in which the direction of lighting is identical with that of the landscape, and don't forget that if the light is coming from the side, the negative gives two alternative versions, depending on which way up it is projected. See how *contra jour* lighting goes with silver linings, and how flat lighting on the foreground is repeated on the clouds. In the evening, clouds are lit in a distinctive manner quite different from mid-day. High in the sky the clouds may be veritable galleons in full sail — but lower down the sky will be paler and more broken, so it is useless printing over the horizon clouds characteristic of the zenith.

Clouds must be studied so that the appropriate conditions can be associated with them.The sou'-wester clouds are like great tufts

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of cotton wool, soft, large, and almost cuddly, and they swim so low as to impart an even greater sense of depth to the infinity of the sky. As the wind veers through west to north-west the light becomes harder, and the clouds more solid, and heavy with indigo shadows, and the visibility is invariably good. So if the distant landscape shows poor visibility it is no good topping it with a sparkling nor'-wester sky. The chill winds in the north and east sectors bring a pale sky and diaphanous clouds skimming over the haze.

Plate 19 shows the use of unsuitable clouds, of which Plate 33 is a print from the whole cloud negative. The lake was taken late in the evening with soft, low, side lighting, and the clouds which appear on Plate 20 under similar conditions. The result is unity, the conditions of lighting and sky are in harmony. The clouds of Plate 19 were collected when the sun was high in the sky behind the camera. Not only are the lighting conditions quite different from the foreground, but see how false that cloud looks, now that it has dropped almost to the level of the horizon.

Quite apart from aesthetic considerations, many prints will be seen on which the overprinting has been so badly done, that the join has not been concealed; so let us now consider the mechanics of the work, and start with a really simple case so that the principles can be understood. Plate 21 shows the Giant's Causeway in Antrim. It was a clear bright day with only a few streamers of thin cloud in the sky. The exposure had to be generous to obtain detail in the rocks, and as the sky was not of value, no effort was made to record it and no filter was used, for if the clouds are absent, the more blank the sky, the easier the subsequent work of filling it.

With the foreground negative in the enlarger, focus and compose on a piece of stiff white paper, the same size as the final print, and draw in the horizon on the paper with a thick pencil line. Now on another piece of opaque card draw in the same line again, and cut along it to divide the card into two pieces — these will be the shading masks. Replace the white paper with the bromide paper, and using the top half of the separated card, hold back the original sky, keeping the card moving throughout the exposure. Remove the

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18. *A peaceful evening scene spoilt by a bald sky*

bromide paper, and before putting it away, mark the top with a pencilled cross on the back, otherwise the clouds are liable to be printed upside down on the base! Elementary — but you'll do it one day!

Replace the foreground negative with the sky negative, and focus on the white paper. Using the pencil line as a guide, move the paper until the sky is in the best position relative to the horizon. This is an important point, and to get the sky to fit the picture better it may be advisable to enlarge it either more or less than the foreground, but don't overdo the difference. Mark the position of the white paper with panel pins if a frame is not used, so that the bromide paper can be replaced in exactly the same position, and insert two more pins at the two ends of the horizon line. Replace the white paper with the bromide paper, and now hold back the foreground by oscillating the bottom half of the masking card by about one inch (on a 20 in. by 16 in. print — proportionally less for smaller prints) so that it never moves above the horizon as indicated by the panel pins. The result will give Plate 22.

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19. *Shows the result of adding an unsuitable cloud formation — the whole of the new sky is shown on Pl.* 33

20. *An harmonius effect — with the sky printed in twice!*

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Now this is a very easy example, because the horizon is close and relatively heavy in tone, and clouds have been selected and arranged so that only their lighter parts overlap the rocks, the degrading effect of printing the clouds over the rocks is therefore scarcely noticed, and no special precautions need be taken to avoid it.

Now consider Plate 23. This was taken on a day of hazy light, and see how pale are the tones of the cathedral tower compared with the bridge. By adopting the same method as for Plate 22, i.e. by printing the clouds over the cathedral and trees right down to the top of the bridge, Plate 24 results. Notice how the cathedral has now received not only the original exposure for the straight print, but also the sky on top of it, and is as a result much darker; compare its tone with the bridge, and see how the effect of recession has been lost, because the background is now, if anything, bolder than the centre. (The reader may prefer this version, but the importance of this illustration is to show what happens — for cases will arise where the effect would spoil the picture.)

This can be partly overcome by holding back the top portion of the print over which the sky is to be printed, for, say, a quarter of the foreground exposure time. Then the tower will have received a total exposure consisting of three-quarters original subject plus a new sky. The effect of the sky will still be to degrade slightly the tower and trees; but the overall depth of the top portion of the print now approximates more closely to the original, and the recession is restored. See Plate 25. (Notice the cloud pattern invading the shadowed part of the tower on Plate 25. Here is a case either for local reduction to lighten the darker area, or for oil reinforcement to strengthen the weaker, until the tone is uniform.)

This may seem rather involved, but it is an elementary principle which is very important when adding clouds. Note that any attempt to cut a mask to conform to the outline of the trees and tower would fail, because it is too complicated; the join would show in the form of a strange halo round each tree, and the gaps between branches would remain blank.

Plate 2 is another case where similar principles were involved. Much of the charm of this picture lies in the soft distance, a

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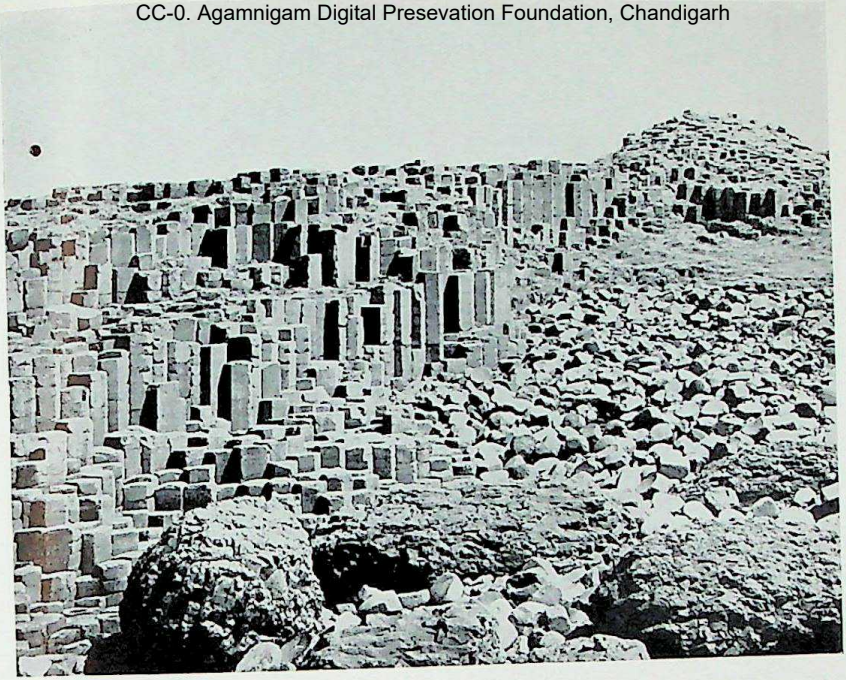
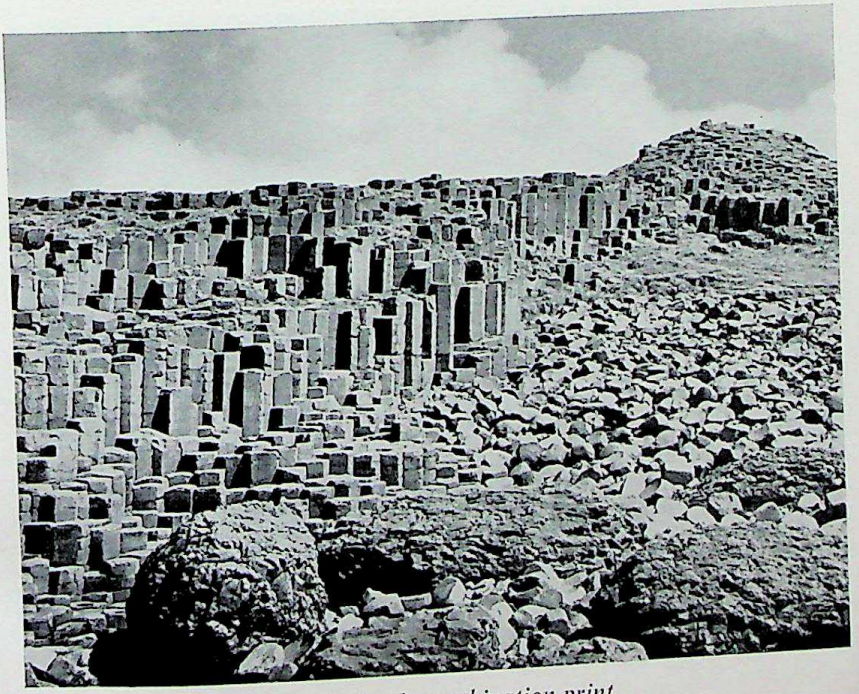
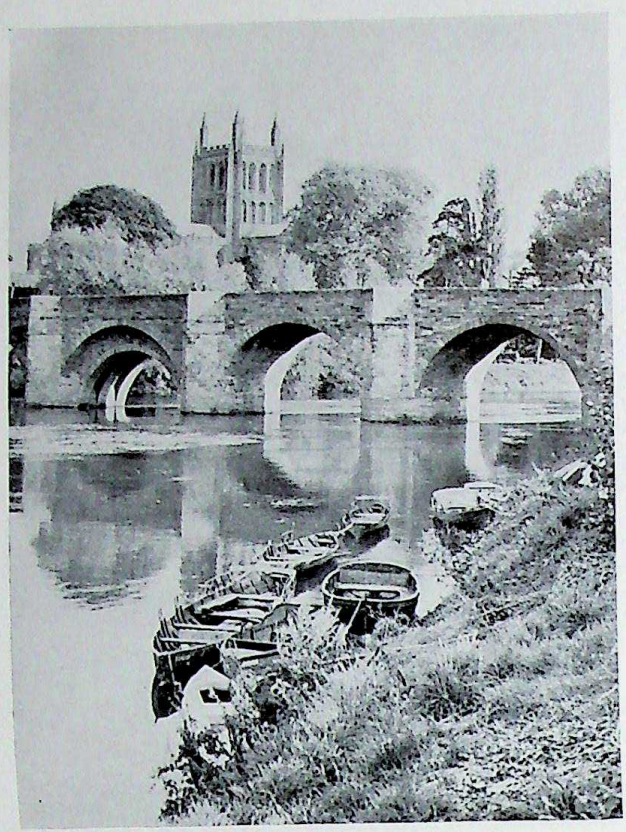


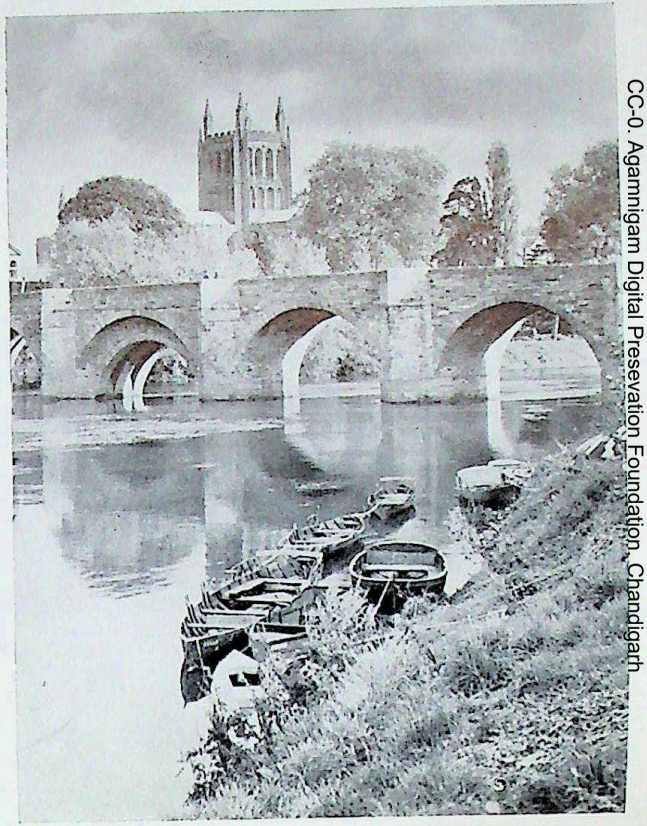
21. *The Giant's Causeway*



22. *A simple combination print*
*Note how the white clouds follow the horizon line*



23. *Hereford*



24. *With sky added.*
*Note that tower and trees are now darker*

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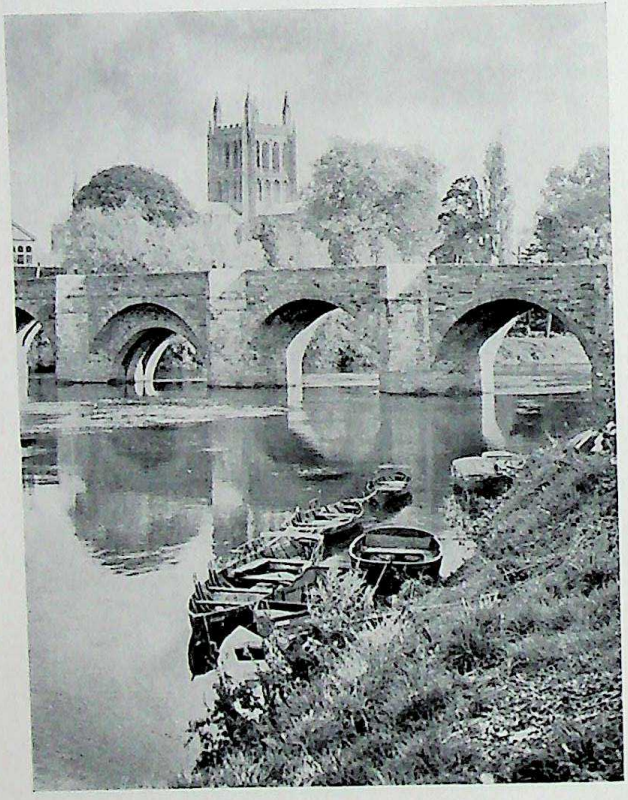

25. *The tower and trees have been held back so that without the overprinting they would be lighter than Pl.* 23. *If this is not done the added sky density will render them darker than the original as in Pl.* 24

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characteristic which could easily be lost if degraded too much by the new sky. Here the whole of the top portion of the main negative was held back for a quarter of the exposure time, the mask oscillating twice the height of the figure, with the head as its upper limit. Then the mask which held back the base while the sky printed, moved over the same ground. In such cases it must not be forgotten that the new sky will be slightly degraded by an exposure of three-quarters of the old one, so test strips must repeat these conditions if they are to represent accurately the final result. (Points to note are that the tree is degraded at the top, but not at the bottom, and that the sky pattern appears in places in the trunks. Both faults can be corrected with oil colour — the print has not been retouched, to show what happened.)

The exact location of the band over which mixing takes place can be very important. Look at Plates 26 and 27, and referring to Fig. 7, where (a) ($a_1$) is the edge of the mountain, consider the two extremes:

(*a*) Suppose mixing takes place over the area (a) ($a_1$) (c) ($c_1$). The sky is much bolder in tone than on Plate 25 and will degrade parts of the edge of the mountain, creating shadows which will follow its contour and look unnatural.

(*b*) The reverse occurs if mixed over (a) ($a_1$) (b) ($b_1$), for here the sky, along the edge of the mountain, will have received no exposure from the cloud negative, and will appear blank, the tone strengthening steadily from (a $a_1$) to (b $b_1$), and giving a halo effect. (See Plate 28.)

The answer is, of course, to compromise, and Plate 27 is the result where the band overlapped mountain and sky in the proportion of about 2 : 1. The print is not retouched, and there is slight degradation on the mountain, and a perceptible, but not very serious halo. The careful use of oil reinforcement, and possibly a little local reducer would cure this completely.

The exact degree of overlap can only be determined by test strips, and since it is important to be able to control the movement of the mask closely; two panel pins merely defining the position of the horizon are not adequate, and should be replaced by small squares of white card pinned to the baseboard (see Fig. 7), the

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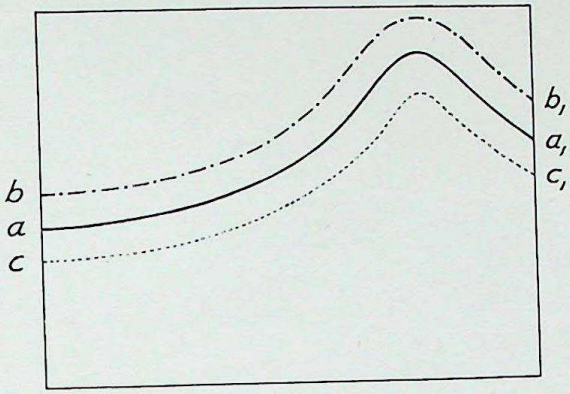
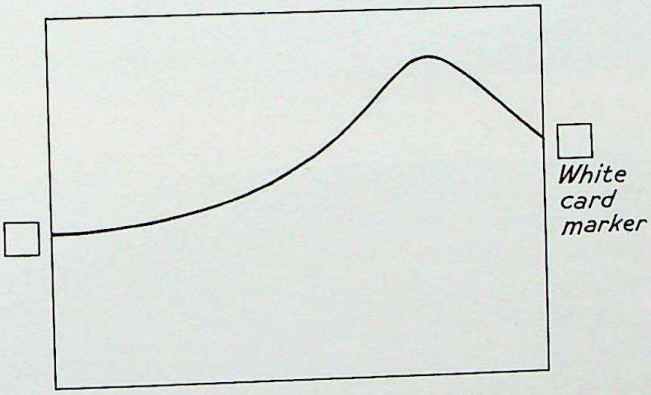



*Areas of overlap of sky and land*




*The set-up for printing Pl. 27*

*Fig. 7. Combination printing*

width of the squares determining the limits over which the masks are moved. Test strips should be used, and the sizes and positions of the markers altered until the best effect is produced, noting that a slight halo is easier to remove than degradation.

In Plates 29 and 30, the mixing occupied a relatively broad band, entirely in the sky. There was reasonable tone at the base of the original sky, but it was of poor quality and design, so it was

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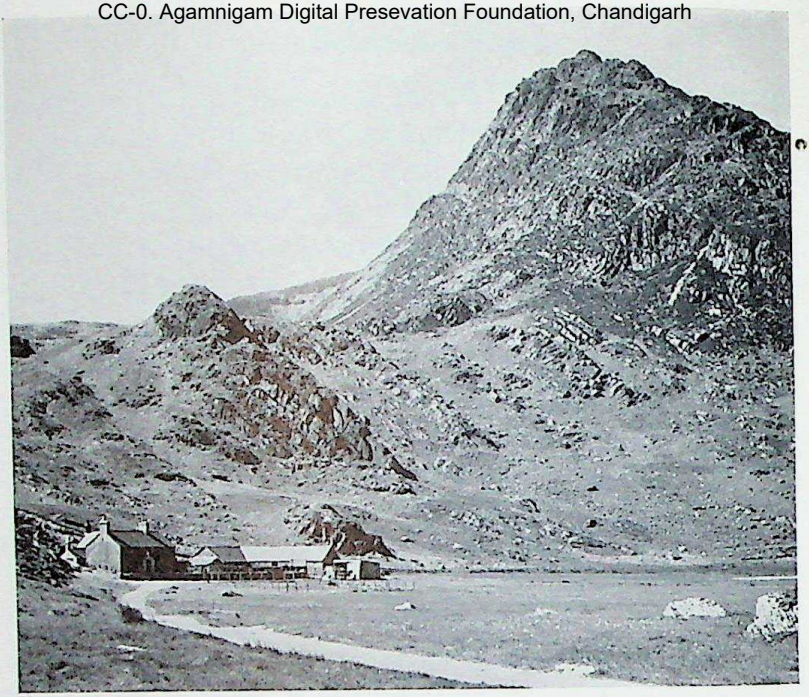
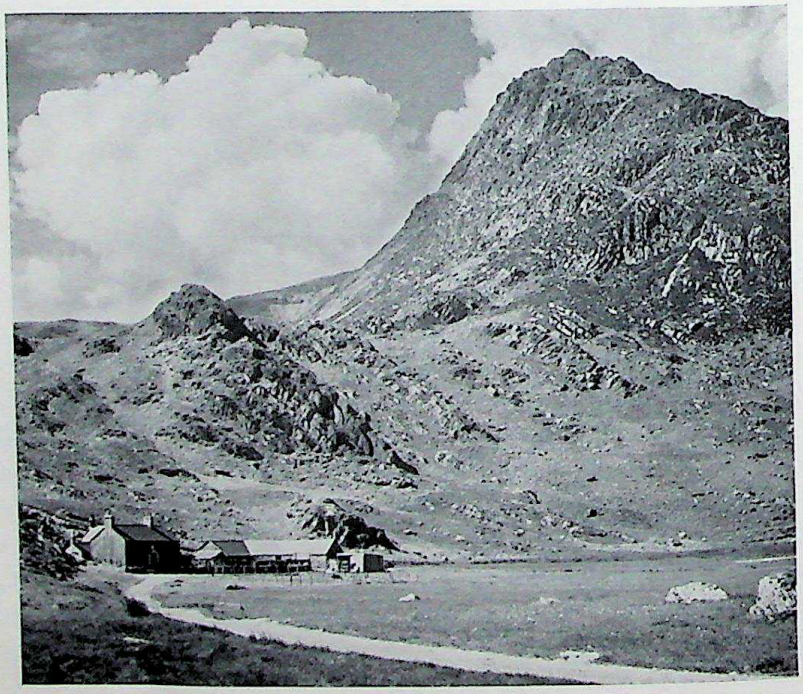


26. *Tryfan*



27. *A bold sky adds stature to the mountain*

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28. *Showing the halo effect of bad masking*

blended with the new one. At the edges of the mountains on Plate 30 it is all original sky; half-an-inch higher it is half-and-half; and an inch above, it is all new sky. No falsity has been produced because both skies were of rather similar tone and pattern where they mixed. (*Note:* Figures are related to a whole-plate print.)

In case the reasons for these slightly different techniques may still be rather obscure, let me repeat briefly the cases covered:

(*a*) Heavy Horizon — Superimpose a light toned cloud pattern and mix within the original subject. (Plate 22).

(*b*) Light toned Horizon — Avoid degradation, and the use of bold cloud formations. Hold back a part of the horizon, and make up density by overlapping. (Plate 25).

(*c*) Boldly Patterned Horizon and Clouds — Area of overlap should be relatively small, and carefully worked out in relation to horizon. (Plate 27).

(*d*) Base of original sky good but top poor — Mix a new sky with the old one, using broad shading and a similar quality sky. (Plate 30).

There are of course other conditions, but if the reasons for the

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29. *A print in which the sky lacks quality*

30. *The transition from old to new clouds is gradual; from the hill-tops well into the sky*

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slightly different techniques are appreciated, ways of tackling them can be evolved once the basic principles are understood. Make no mistake, it is really absorbing, and working out the method for achieving a difficult sky addition, is among the most interesting aspects of photography.

So much for the join, but there are many other points to be considered. For instance if there is water in the foreground, skies must be even more carefully selected to match the reflections. If the water is still, mirroring the sky, it may even pay to print the clouds in twice — once where they should be, and again upside down over the water. This was done in the case of Plate 20. See how the sky tone has subdued the hard quality of the blank water.

If the water is disturbed, it is only necessary to ensure that the lights in the sky correspond to those in the water — as in Plate 32. This was another case where the overlap was all below the top of the hills, with the original sky and part of the hills held back somewhat, the density of the hills and trees being restored by the new sky.

Not many skies would fit Plate 32 so well as the one used, so it follows that a large and varied collection of cloud negatives is essential if a wide range of subjects is to be tackled. Avoid having 'favourites'. Folk become suspicious if all your best landscapes turn up with the same sky.

Whenever a good sky is seen, take it — and from as high as possible — for it will be more useful if it extends right down to the horizon. (See Plate 33). All sorts of skies will be needed, typical of fine weather, and storm, filmy wintry skies, sunsets, and just a few dramatic ones. At first, of course — everybody does so — the tyro will only collect those massive lumps of cumulus in the van of a thunderstorm, and which look so spectacular, but after a time it will be found that these are among the least useful, because so often they will not fit the conditions, or they steal the picture by claiming too much attention. The typical fine-weather clouds are not very interesting for they tend to form in layers, bulbous on top, and flat beneath, and they are too orderly, like a flotilla of destroyers.

Sometimes the sky is spoiled by a bright patch which will not

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31. *Rydal Water*

32. *A combination print which called for a careful choice of clouds*

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respond to printing up, because the area is too contrasty, and adjacent or intermingled clouds would print unnaturally dark before the lights were subdued. To correct this, swing the red filter over the enlarger lens, and move the bromide paper so that an area of even toned sky falls where the patch had been. With a suitable mask allow the new part of the sky to print over the old. This will fog down the lights without unduly increasing the density of the darks. This is a valuable technique, and was used to darken the top left-hand corner of the sky in Plate 4.

Apart from compositional, and emotional reasons, there is often a great technical advantage to be gained from adding clouds from another negative. When the clouds are part of the original scene, the best exposure, particularly if the foreground is at all heavy, will be a compromise, barely sufficient for the foreground, and probably too much for the sky, as in Plate 31. But when sky negatives are collected, the foreground doesn't matter. Using a light yellow filter and cutting the exposure to about an eighth of that for a normal subject will give a negative which is properly exposed for the sky, and in which full gradation in the highlights is preserved. So if it is decided not to use the sky when taking the picture, that little bit of extra exposure to improve the shadow quality can be given if necessary. The subsequent addition of a sky from a properly exposed cloud negative will provide quality in the highlights and shadows of a contrasty subject, which no print from a single negative could normally cover.

It may be asked, why must the masks oscillate, why not cut them out accurately, and merely lay them on the bromide paper? One objection is that the line of demarcation is too clearly defined, the cut-off imposed by the masks being sharper than the photographic image. This can be overcome by laying the masks on a sheet of glass placed about an inch above the paper, so that the shadow cast is slightly blurred. Plate 36 was done in this manner.

Focus the negatives concerned in the usual way, and about an inch above the bromide paper plane, support a sheet of good clear glass free from blemishes. On a piece of thin card placed upon it, project the negative of the subject which is to dictate the shape of the mask — in the case of Plate 36, the foreground. Being an inch

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33. *A print from a useful cloud negative. The clouds are shapely and well-rendered and extend right down to the horizon*

too close to the lens it will be slightly blurred; but don't refocus. With the image as a guide, draw in the masking line — in this case it was quite simple because the new foreground was in fact the top of a sea cliff, and it merely meant following the edge. Cut along the line, noting that for this method the masks should be accurately made. With the previous system this is less important.

With the foreground negative in the enlarger, fit the two masks together, and move them about on the glass until the join is back in the position in which the line was drawn. Place a weight upon the top half, and removing the lower portion, expose the foreground on the sensitive paper. The paper must now remain in position throughout the subsequent operations, so it is advisable to secure it to the baseboard with sticky tape so that a sheet of cardboard can be placed over it to protect it from the light, without moving it. Replace the lower mask so that it meshes with the upper, and weight it down. Change the negatives, and if

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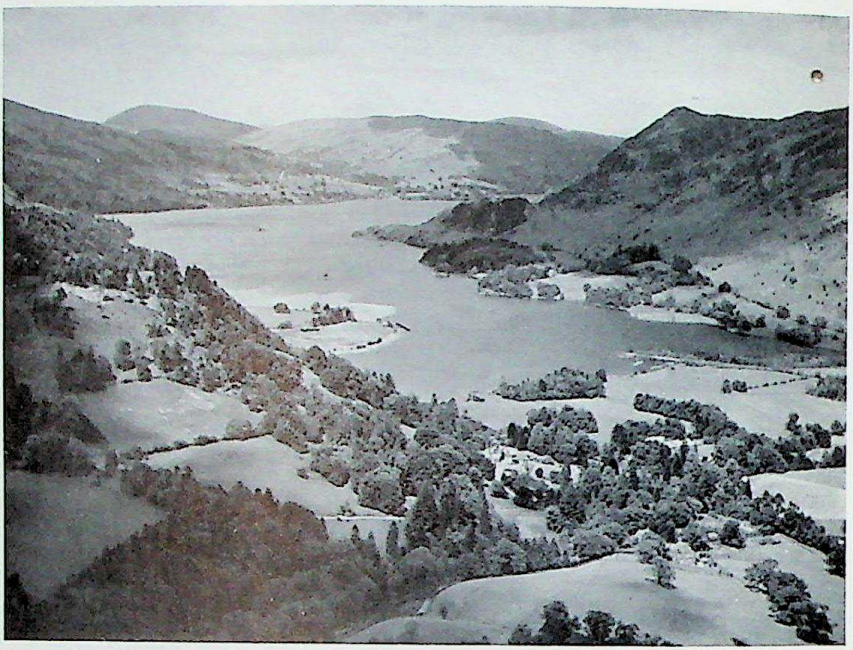
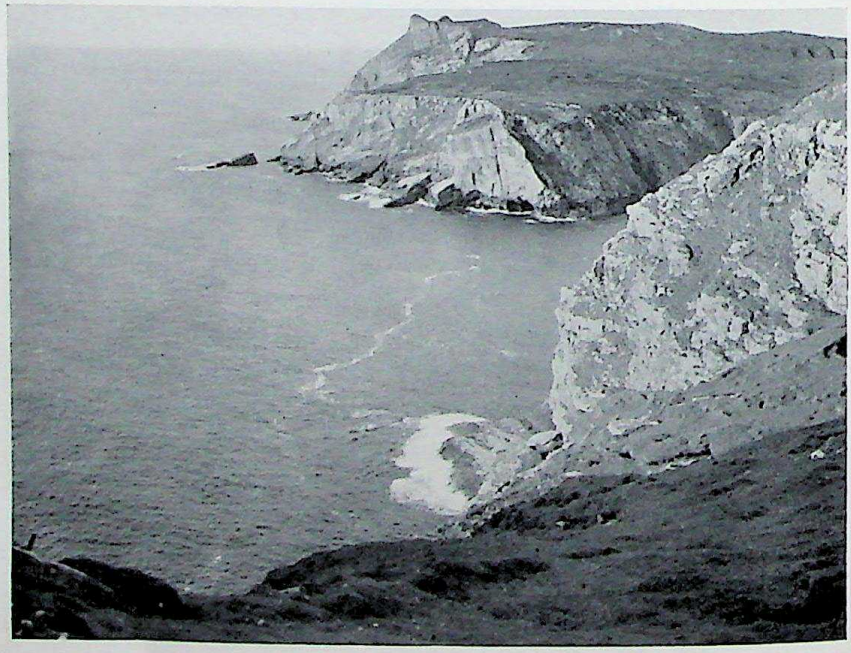


34. *Ullswater*



35. *Horn Head*

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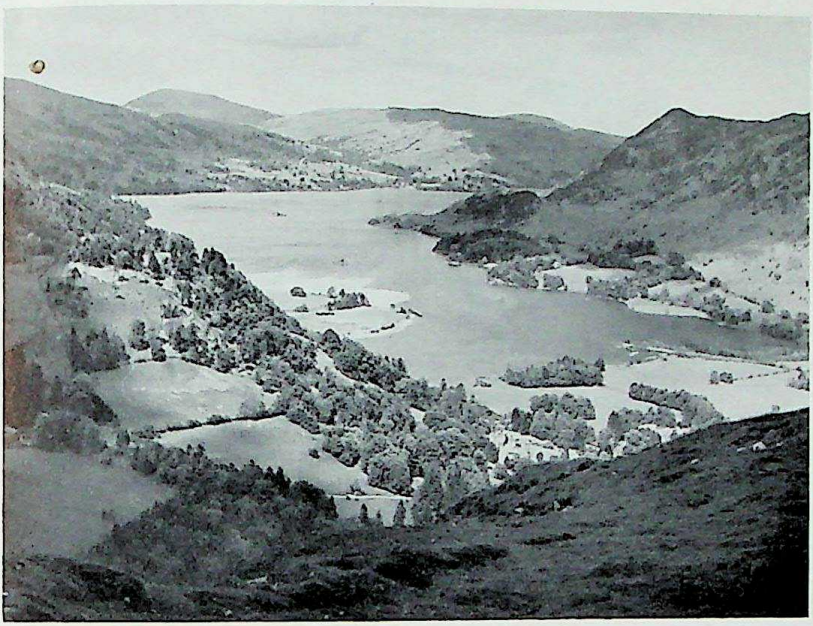

36. *Combination print from negatives of Pls.* 34 *and* 35

necessary adjust the position of the new one so that its image falls in correct relation with the mask. It is the negative which must be moved, for if the paper support is shifted, the angle at which the light passes the edge of the mask will be altered. Remove the upper mask, when the remaining portion should now throw a shadow exactly over the previous exposure — had the angle of the light past the edge of the mask been changed, this would not happen. Remove the protective card from the bromide paper, and complete the exposure.

Providing the masks have been accurately cut, and have not moved at any time, the join should not be very noticeable, but it may need a little retouching.

It should be realised that on one mask it will be the lower edge which cuts off the light, and on the other, the upper edge, depending on the angle of incidence, so that it is important that both halves should be flush on the glass, and that the masking material is relatively thin.

Combination printing is normally associated with 'putting

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37. *Mulroy Bay — showing the horse to be removed*

38. *This is the combination print!*

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something in', but the method just explained can sometimes be used for the reverse process as in Plates 37 and 38, where a horse, a rather ungainly horse, has been removed. Perhaps that isn't fair — the horse's outline is rather peculiar, and the fault lay in taking the animal in such a position. But there it is, and since its shape excites curiosity as to its identity, it becomes a point of interest of no pictorial merit, and would be better removed.

For this a small disc, large enough to cover the horse with some margin, was cut from the masking card, which was adjusted so that an empty portion of the meadow similar in tone and texture to that occupied by the horse was projected through the hole. The first exposure was simply a small circle of plain glass. The disc was replaced, and the negative moved so that the image of the horse fell inside it. The surrounding card was removed, leaving the disc masking the horse, and the exposure completed. A little retouching where perhaps the patterns on the grass did not match, and the foreground was empty!

The method can, of course, be used for clouds, and is probably the best way of adding clouds when a light-toned object projects into a blank sky. It is rather more finicky than the mixing method, however, and I normally use it only for those cases where the alternative is impracticable.

Occasionally it is sufficient to combine the two negatives in the enlarger as in Plate 40. The original sky was of an even medium tone, so that this area on the negative was relatively light, while the cloud negative which was made through a deep orange filter was contrasty, with the blue sky almost clear celluloid. The negatives were arranged so that the white clouds did not touch the bird, which was merely slightly fogged by the sky negative whose contrasts were similarly reduced by the original sky tone. This was one of those shots in which luck plays an important part. It was taken from a boat and, so still was the gliding bird relative to the ship, that I had time to flip up the magnifier on my Rolleicord, and focus on his eye before shooting him. Truly an obliging subject!

In all these systems there is great scope for ingenuity, and only some of the applications are indicated; the skilful photographer will find many more.

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39. *A plain sky even of good tone is often monotonous*

40. *Print from two negatives sandwiched together in the enlarger*

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# 6

# Local Reduction

When the print has been fixed, washed and dried, it should be examined carefully to see if it can be improved by local reduction. Such work can be done on the wet print as soon as it is fixed, but it is far better to allow it to dry, and to decide at leisure the scope of the work required. The print will look rather different when dry (chlorobromides for instance tend to become darker), and to rush the job, particularly if tired after an exacting darkroom session, is often fatal to good results.

The work can be conveniently divided into two categories as follows:

(*a*) The removal of black spots. As well as physical blemishes due to pinholes in the negative, would be included all distracting small detail, such as distant telegraph poles and isolated cattle in landscapes or pimples, etc., in portraits.

(*b*) Areas which need lightening; and which can be middle tones which are a trifle heavy, shadows lacking gradation, or highlights in which the brightest light is still slightly veiled.

The image is removed with chemicals, which convert the silver into a soluble compound, and the reaction is stopped by flooding the area with water. This means that the work must be done on a print which has been soaked until it is flaccid. To control the effect, the wet print should be slapped face upwards on a sheet of glass standing in the sink, and leaning backwards at a convenient angle. Water is applied as a jet from a length of flexible hose terminating in a glass nozzle about $\frac{3}{16}$ in. in diameter.

For black spots the reducer must be in a very concentrated form, so that it will act quickly, but not spread — and yet be stopped

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instantly when required. The most convenient reducer is a modified form of 'Farmer's', in which a fine spotting brush is dipped in a 10% solution of sodium or potassium cyanide, and twiddled on a crystal of potassium ferricyanide.

Place the crystal, which should be a good, clear, red specimen, free from yellow crust, on a piece of dry blotting paper. Pour about ten drops of the sodium cyanide solution into a small phial, dip the brush in it, and twiddle it on the crystal. If a droplet remains on the end of the brush, touch it gently on the blotting paper to remove the surplus moisture. Mop the print surface dry with a wad of cotton wool, or viscose sponge, and touch the tip of the brush on the black spot. When it has disappeared, sweep up the jet of water and stop the action. Work upwards from the base of the print, to avoid flooding the spots which still remain.

To remove black lines, such as telegraph wires, etc., stroke the brush along them about $\frac{1}{4}$ in. at a time, stop the action, swab the print surface dry again, and move on. It is rather tedious, but there is no short cut to success. The reducer works quickly, so that efforts to remove more than $\frac{1}{4}$ in. at a time, will result in the part of the wire first touched bleaching right out, while the brush is still on the paper. The object is to remove only just sufficient to blend the spot or wire with the background, but if the action goes too far it is relatively easy to add density by subsequent spotting. When the work is finished, fix and wash. Plate 4 shows how effectively a pair of telegraph poles can be removed.

*WARNING.* It should be noted that cyanide is a deadly poison, and must always be kept in a clearly labelled poison bottle, locked up when not in use. Hypo. can be used instead, but is not so clean working, as it tends to leave behind a yellow deposit when a large spot is removed.

Black spots and telegraph wires can also be removed by knifing the print; but since this marks the surface, no matter how well it is done, the chemical method is to be preferred. However, if the print suffers from only one or two black spots, the damage may be so slight as not to matter, and the labour of soaking, fixing, and rewashing the print again is avoided.

Retouching knives are made specially for this purpose, but I

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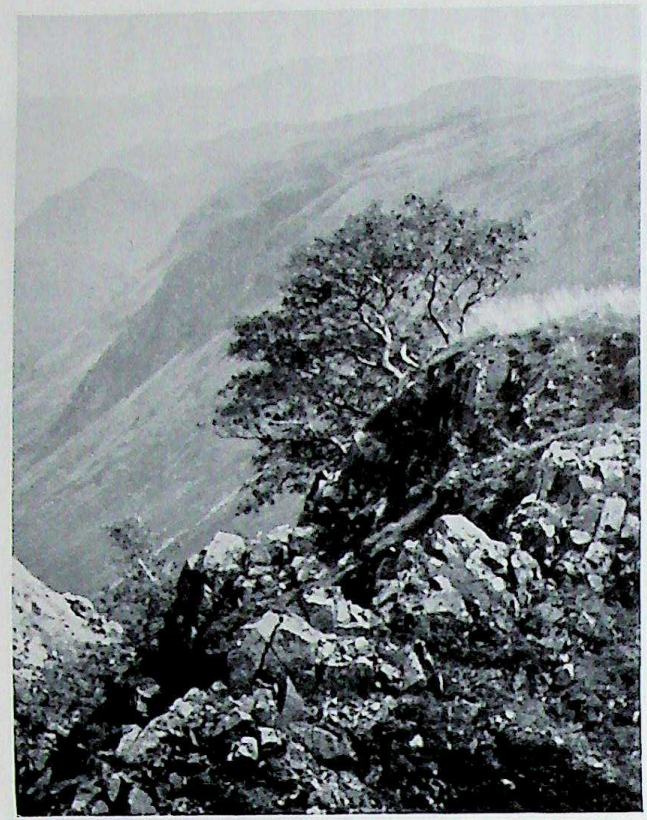
normally use a standard three-hole safety-razor blade. The object is not to dig the spot out like removing an eye from a potato, but very carefully to shave off the top of the emulsion in which the silver grains are embedded. Providing that some of the emulsion is left, soaking the print again will greatly reduce the damage.

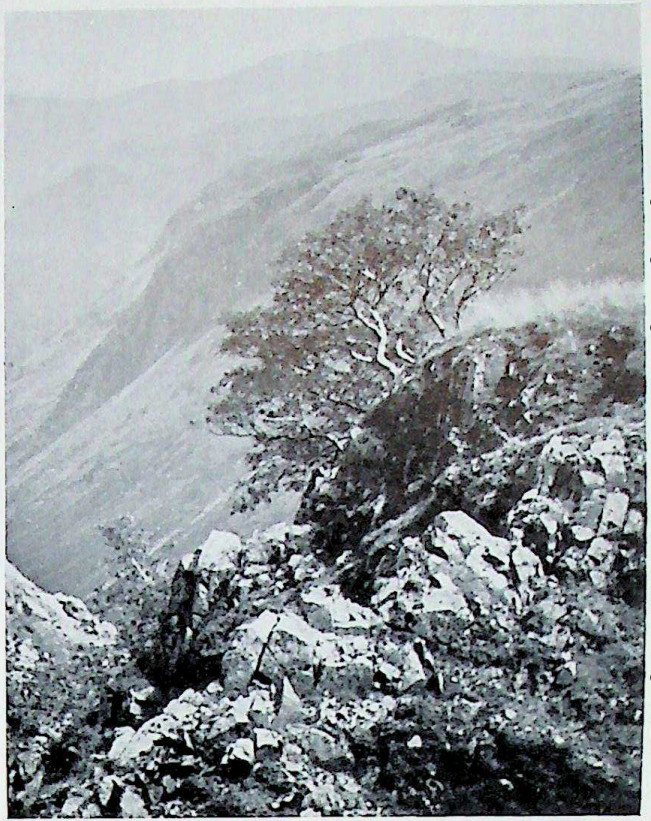
The blade should be held upright so that the corner touches the print with the cutting edge at an angle of about 15° to the surface. It is then pulled gently over the mark, and it is much better to confine the strokes to one direction, to avoid roughening the surface. The secret is infinite patience; the longer it takes, the less the surface is marred.

Prevention, as always, is much better than cure, and the most prevalent cause of black spots is dust settling on the negative before exposure. It is a good plan to clean the interior of the camera regularly, not forgetting all the nooks and crannies from which dust can be shaken into the main body. It is often claimed, and quite rightly, that for the same reason it is better to wind on just before taking, rather than just after. I must confess that I never do, because I have grown up with the old system, and the action of winding on has become automatic as soon as the shutter clicks, and I fear the inevitable crop of double exposures which would follow any change of sequence. (With many cameras such as the Leica, of course, where the shutter wind and film transport are interlocked, the precaution advocated is normally adopted.)

Enough of spots! Many prints can be improved by reducing the density of certain areas, or by brightening highlights to impart the maximum brilliance to the picture. On Plate 42 the foreground rocks have been lightened to strengthen the leading line towards the clump of trees, the trunks of which have also been reduced with a brush, by the method just explained. On an exhibition size print of Plate 4, it would probably pay to apply a dilute reducer to the water to ensure that any veiling of the highlights is removed. It is surprising how much highlights can be degraded, before the effect is noticed: they may seem as bright as possible, but compare them with the back of another print to see how often there is a trace of tone in them. A weak reducer carefully used will remove the very slight fog without affecting any of the other densities. The process



41. *A Lakeland scene which is rather dull*



42. *Shows the effect of local reduction on trees and foreground rocks*

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should be used with caution, and restricted to those cases where the lights really are brilliant, and where it is this effect which is wanted.

For such work, Farmer's Reducer is probably still the best, although its reputation for destroying highlights and staining prints is well deserved. It is one of the pictorial photographer's most powerful allies — when under control — but too often, like fire, it gets out of hand, and will ruin a fine print in a few seconds.

The reducer consists of a mixture of solutions of hypo. and potassium ferricyanide and many claim to make it up to a pale lemon yellow. But so fickle is its action, and so indeterminate is lemon yellow as a definition of concentration, that it is much better to measure out the ingredients, so that at least one of the variables is eliminated. For general purpose work a good formula is:

8 oz. 5% Hypo.
30 minims 10% Potassium Ferricyanide

For forcing gradation out of over-dense shadows, the quantity of ferricyanide can be increased, while for the slightest possible paring of delicate lights, it can be cut to as little as 5 minims, but the important point is, that by measuring it, experience can be obtained, and the effects duplicated if a note is made of the strengths used for certain conditions.

The reducer is applied on a wad of cotton wool, using the same set-up as before, and playing the jet just below the affected area, to prevent the strong solution running down the print where it is not wanted. Alternatively the print may be laid in a dish, and the action stopped by flooding it with water. Have a jug ready in the free hand, so that there is no delay in moving the dish, or turning on taps, for the critical moment is a very brief one.

The mixed reducer is very unstable, and soon loses its strength. It is persisting with exhausted solutions which causes stain, by prolonging the time during which they are in contact with the emulsion, so after two minutes, throw it away, and make up some fresh.

For those interested in chemistry the action of Farmer's Reducer is as follows:

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(a) $4Ag + 4K_3Fe(CN)_6 = Ag_4Fe(CN)_6 + 3K_4Fe(CN)_6$.

(b) $3Ag_4Fe(CN)_6 + 16Na_2S_2O_3 = 4Na_5Ag_3(S_2O_3)_4 + 3Na_4Fe(CN)_6$.

This means that the silver is first converted into silver ferrocyanide: which is insoluble in water. Then the hypo. converts the silver ferrocyanide into a complex silver compound, which is soluble in water, and disappears in the wash. As the reducer is only briefly in contact with the emulsion it is almost certain that when the action is stopped by flushing with water, there will still be some silver ferrocyanide in the emulsion, on which the hypo. has not had time to work. No amount of washing will remove it, because, remember, it is insoluble, and eventually if it is left it will discolour and cause orange stains. So after all reduction has been completed, refix the print, and wash thoroughly.

Some types of papers differ in the way they are affected by the reducer. The action is quickest on the warm tone chlorobromide papers, on which the higher concentrations of potassium ferricyanide should be used with caution. Reduction also affects the tone of the image on these papers. This is inevitable, because the warmth is due to the fine grain structure of the image, and, obviously, reduction (which is a gradual dissolving away of the silver), makes the grains smaller still, so that as it progresses the image becomes warmer. The effect is so pronounced as to make any but very superficial local reduction impracticable on the chlorobromide papers. It is only below a certain grain size that the image colour is affected, and ordinary bromide prints should be immune from changes in tone, because their grain structure is normally much coarser than the critical value.

A slightly too dark print may be immersed in a dish of the reducer. In fact, this is strongly to be recommended for snow scenes, where there is a large proportion of highlight detail, in which the maximum brilliance is required. For, referring again to the diagram in Fig. 1, the extreme highlights lack contrast because of the characteristic flattening of the toe of the curve, whereas contrast increases as the middle tones are approached. If, therefore, the print is made slightly too dark, so that even the brightest lights are veiled, the contrast of the degraded highlights will be increased. The reducer is then used very carefully until the veil

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over the brightest lights has been removed. This will give a brilliance which is unattainable by direct development. With a snow scene in which highlight areas are scattered over the print, an overall bath in the reducer may well be used. Soak the print in water, and make up the reducer in another dish using, say, 15–20 minims of potassium ferricyanide to the 8 oz. of 5% hypo. for bromide prints, and rather less ferricyanide for chlorobromides. Drop the print face downwards in the solution, and at once turn it over, and keep the dish rocking so that the surface remains immersed, and just before it seems right, pull it out quickly and plunge it under water again.

There are two things to notice here. First, never pour the reducer on the print, for this will cause uneven action. Secondly, don't leave the print in the reducer too long; stop when it seems that another few seconds will do it, for the action cannot be stopped on the instant. If it still isn't quite bright enough, make up some very dilute reducer and take it down by careful stages, for if it goes too far and eats away the highlight gradation the print is ruined beyond repair. In fact when the 'almost right' stage is reached it is better to revert to selective reduction, with the print supported on a glass plate, and the solution on a wad of cotton wool, for then attention can be concentrated on a selected area, and control with the jet is faster and more positive. Many prints are spoiled in a reducing bath, because one highlight area clears, while another is being watched.

To the reader who has not tried reducing prints before, I would say, practise on some waste ones before tackling those that matter. I may have over-emphasised the difficulties, but one sees so many prints which have been ruined by poor reducing, I feel the warning is not out of place. The secret is to keep stopping the action before it reaches the critical stage, to use fresh solutions, to fix after reduction, and — practise.

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# 7

# Toning

The image colour of a photograph can often enhance the mood of the picture. It can provide emphasis like another form of tone — the inflexion of the voice, which can convey anger or sorrow even in an incomprehensible tongue.

In the same way that folk can be cold or warm, hostile or friendly, so prints can depart from the neutral black and become bluer or colder, or browner and warmer. Evening light is mellow, and is best interpreted by brown-black tones, on an ivory or cream base. For snow scenes the cold blue-black of gold toning is far more appropriate.

The most suitable image colour is also related to the key of the picture. Warm tones are not often successful for subjects in which there are considerable areas of fairly light middle tone, such as misty scenes, or high key pictures. Delicate greys look muddy when they are brownish, but have a pearly quality when the colour is cold. For bolder landscapes the slightly warmer image of the faster chlorobromides is usually quite fitting, but again, if the picture includes snow peaks, an austere quality intrudes which conflicts with the warmth.

Striking patterns are probably best in neutral blacks, because black and white give the greatest contrast, and here it is the impact of design which matters, and atmosphere is secondary.

The artist has considerable licence, both in treatment and colour, which helps him to express the mood of his picture. The photographer is less versatile, so that it is all the more important that he should make the most of such control as he has. Image colour exerts a subtle, but powerful influence on the message of a photograph, but above all it should be treated as a contributory factor

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only. Many photographers claim a preference for one particular tone. They pass through phases; for a time everything is sulphide toned, then when that palls, there is a period of gold toning, and so on. This is the wrong approach; a print should be developed, or toned, to suit the subject. The more unusual colours should be used very sparingly, and with real purpose; never for the sake of the colour. Not only is this artistically bad, but (on a more mundane note), judges are often conservative and dislike them, while exhibition committees, who have the task of hanging them where they will not kill everything within range, loathe them.

Before discussing methods for toning the image, it would be as well to consider the effect of the base colour. There are in general, three tints, white, cream, and the intermediate ivory. Warmth can be conveyed by a browning of the image tone, or a yellowing of the base tint. Obviously a white base is best wherever a cold effect is wanted, but cream should be used very sparingly. It is better to obtain warmth by a brown image, than by a cream base, while the use of both will make the print too hot for most subjects. In addition, the cream tint represents an overall fogging of the highlights, thus reducing their brilliancy, and the apparent quality of the print. For most purposes where a white base is felt to be too cold, ivory is probably the best compromise.

There are many different processes for toning, but the following table shows briefly how some of the more useful colours can be obtained:

| | |
|---|---|
| Blue Black | Gold toning on chlorobromides. |
| Neutral Black | Normal development on bromides. |
| Warm Black | Normal development on fast chlorobromides. |
| Brown Black | Normal development on slow chlorobromides.<br>Curtailed or warm tone developers on fast chlorobromides.<br>Pyrocatechin redevelopment on bromides. |
| Warm Purplish Blacks | Chromium Intensifier on Chlorobromides. |
| Sepia | Sulphide toning on bromides |
| Purple | Selenium on chlorobromides. |

There are many other colours, greens, reds, etc., but they are of little value for exhibition purposes, and details are not given. The colours to be obtained by direct development are investigated in Chapter 3.

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GOLD TONING

Comparatively few English prints are gold toned, although it is a popular process in America. The reason might seem obvious, but in fact it is not so expensive as might be imagined, and works out at about 9d. for each 15 in. by 12 in. print.

The colours depend largely on the percentage of silver chloride in the emulsion, and the warmth of the image tone. The greater the proportion of chloride, and the warmer the original print, the bluer the resulting colour. The brightest blues are obtained on chloride or gaslight papers, while bromide papers are scarcely affected. Chlorobromides produce an intermediate blue-black, and naturally the slower papers, which have a relatively higher proportion of chloride, produce the bluer tones. The following solutions will be required for toning:

| | | *Metric* | *Avoirdupois* |
|---|---|---|---|
| A. | Gold Chloride | 1 gm. | 7½ grains |
| | Distilled Water | 150 c.c. | 2½ oz. |
| B. | Thiocarbamide | 15 gms. | ½ oz. |
| | Water | 150 c.c. | 5 oz. |
| C. | Sulphuric Acid | 10% solution | |

The gold chloride is purchased in small glass ampoules containing 7½ or 15 grains. They should be broken under water: the crystals dissolve quickly and the clear fluid can be easily decanted. If strong acid is diluted to make the 10% solution do not forget to pour the acid slowly into the water, and not vice versa.

Before toning, soak the print until it is flaccid, and be quite sure it is free from hypo., then make up the toner as follows.

Make up two solutions:

(*a*) 12 c.c. of solution 'A' plus 24 c.c. of water.

(*b*) 4½ c.c. of solution 'B' plus 4½ c.c. of solution 'C' plus 100 c.c. of water.

Pour (*a*) into (*b*) slowly, while stirring, and add a couple of drops of wetting agent.

Pour the mixture into a dish, and then add the wet print; never pour the solution on to the print. Keep the dish rocking for about 15–20 minutes by which time toning should be complete. The

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temperature of the solution affects the time required; 60°F. should be considered the minimum, while 70–75°F. will promote quicker toning. The reaction is also retarded if the emulsion is hardened, so that the use of plain fixer is to be recommended.

The quantity given should be sufficient for one 15 in. by 12 in. print, but two prints can be toned simultaneously by immersing them back to back, and doubling the quantity of solution. The used solution may do another print, but is not likely to be sufficiently active to produce the full colour.

After toning, prints should be rinsed in water, refixed for 5 minutes, and then washed in the usual way.

As gold is added to the existing silver there is a slight increase in both density and contrast, since the effect is greatest where the most silver was deposited. Prints to be gold toned should be, if anything, a trifle weak, for any tendency towards heaviness will be increased.

### PYROCATECHIN DEVELOPER FOR WARM TONES

Very pleasing brown black tones can be obtained on bromide prints by bleaching and redeveloping in a Pyrocatechin developer. The process is not recommended for chlorobromides, which do not yield such good tones.

The print should be a good quality bromide, developed to finality, but a shade on the light side, because the process intensifies slightly. It should be fully fixed and washed, and then bleached in the following:

| | |
|---|---|
| Water | 4 oz. |
| Potassium Bromide 10% solution | 1 oz. |
| Potassium Ferricyanide 10% solution | 2 oz. |

Wash until the yellow stain has gone, and then redevelop in:

| | *Metric* | *Avoirdupois* |
|---|---|---|
| Pyrocatechin | 1·3 gm. | 20 grains |
| Sodium Carbonate (anhydrous) | 15 gm. | ½ oz. |
| Water | 300 c.c. | 10 oz. |

The solution contains no preservative and quickly becomes a

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filthy brownish-green colour. It is used hot — at around 90°F. — and since this temperature might cause the emulsion to blister, it is a good plan to harden the original print, and to bring it up to 90°F. ready for the developer, by stages. Development is rapid, but to avoid patches of uneven density, it is advisable to give the print at least 2 minutes. It is not necessary to fix again, although the print should be well washed, but fixing will partly curb the tendency to intensify, and will produce a rather warmer tone.

Dr Julian Smith used a Pyrocatechin developer direct on bromide papers, to obtain the rich colours always associated with his work.

The developer he used was as follows:

| | *Metric* | *Avoirdupois* |
|---|---|---|
| Pyrocatechin | 1·3 gm. | 20 grains |
| Potassium Carbonate (anhydrous) | 15 gm. | ½ oz. |
| Water | 300 c.c. | 10 oz. |
| Potassium Bromide 10% solution | 0·15 c.c. | 2 minims |

But again this must be used at 90°F., and it is not everyone who has facilities for keeping a large dish of developer at 90°F. ±2–3° for several hours, so that redevelopment provides a relatively simple way of obtaining similar colours, without the difficulty of developing at high temperatures. As trial test-strips are not involved, the exact temperature for redevelopment is not important.

The redevelopment method was first published by Mr R. G. Fennah in the *Miniature Camera Magazine* in July 1943.

### SELENIUM TONING

This produces a fine rich purple on chlorobromide prints: it has little or no effect on bromides. The colour is quite distinctive, and too pronounced for most subjects, but used with taste it can be of great value. It is particularly suitable for landscapes taken late in the evening, or where distant detail is subdued by haze, when it restores in part the glowing shimmer so characteristic of these conditions.

The following formula is recommended:

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| | *Metric* | *Avoirdupois* |
|---|---|---|
| Sodium Sulphite (crystal) | 75 gm. | 6 oz. |
| or (anhydrous) | (37 gm.) | (3 oz.) |
| Selenium Powder | 1·5 gm. | 50 grains |
| Ammonium Chloride | 50 gm. | $3\frac{3}{4}$ oz. |
| Water to make | 250 c.c. | 20 oz. |

In about three-quarters of the total amount of warm water dissolve the sulphite: add the selenium and boil until it is all dissolved. Add the ammonium chloride when the solution is cool, and then water to make up to bulk. For use, dilute 1 part of solution with 5 parts of water.

The prints should be thoroughly fixed and washed before toning. No bleaching is required, the print is immersed in the toner, which should not be below 65°F. and the dish rocked until toning is complete. This usually takes 10–15 minutes, but before pouring off the solution, the print should be carefully examined to ensure that the colour is uniform, as toning tends to be more rapid at the edges. Finally, wash the print.

### SEPIA TONING

The value of this colour for exhibition purposes is doubtful, as it is too warm for most subjects, and very difficult to hang among untoned bromide or chlorobromide prints. For those who wish to try it the procedure is as follows:

Bleach the print in the same solution as is used for the Pyrocatechin redevelopment, and after washing darken in the following:

| | *Metric* | *Avoirdupois* |
|---|---|---|
| Water | 250 c.c. | 10 oz. |
| Sodium Sulphide (crystals) | 2·5 grm. | 50 gr. |

The sodium sulphide should be kept away from all sensitive materials, which deteriorate rapidly under the influence of the hydrogen sulphide which it gives off, particularly when it is toning.

There is, however, one sulphide process which has limited application, and which can be used on any really good quality bromide print, which has been developed to finality, but which is

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too dark. It is absurdly simple. Soak the print in hypo., and without rinsing it, drop it face down into a solution of 1% hydrochloric acid, and leave it for an hour or so. The acid breaks up the hypo., and forms colloidal sulphur, which works very slowly on the emulsion to form silver sulphide. This should be done away from photographic materials. Make sure all the print is fully toned before pouring off the acid, for again parts of the print may tone more rapidly than others, and any attempt to arrest the action before it is complete will result in patches of uneven colour. The tone is usually a fine rich purple-sepia, but depends partly upon the paper, the colder the original black, the more purple are the tones produced. Only bromides give good colours, for the chlorobromides tend towards mustardy tones.

The great value of the process lies not so much in the colours it gives, but in the slight reduction of the image, for it will brighten up a heavy print without spoiling the gradation.

### CHROMIUM INTENSIFIER

On prints, this process, which is more often associated with negatives, serves the dual role of intensifier and toner. The print is bleached in a solution of potassium bichromate and hydrochloric acid, and then redeveloped. The degree of intensification depends upon the proportion of acid in the bleach, the greatest increase being obtained with the minimum amount. The following formulae will be found suitable:

| | *Metric* | *Avoirdupois* |
|---|---|---|
| Potassium Bichromate 10% solution | 12·5 c.c. | ½ oz. |
| Hydrochloric acid (Concentrated) | See below | See below |
| Water | 100 c.c. | 4 oz. |

The amounts of hydrochloric acid should be as follows:

| | | *Metric* | *Avoirdupois* |
|---|---|---|---|
| (a) | For strong increases | 0·5 c.c. | 5 minims |
| | For medium increases | 2 c.c. | 30 minims |
| | For slight increases | 12·5 c.c. | ½ oz. |

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As the proportion of hydrochloric acid is increased, so bleaching is accelerated; with the minimum amount, times of up to 10 minutes may be needed.

Experience will tell the photographer which to use, but the formula for slight intensification will be found particularly useful for those prints which are just a shade weak.

After bleaching, the print must be washed until the yellow stain is reduced to a mere ivory: on no account redevelop if there are any patches of pronounced yellow colour left, for these will come up weaker in tone. Then redevelop in an ordinary MQ or Amidol developer (the latter is particularly suitable). If the work is done in the darkroom the print should be subjected to a fairly bright light, otherwise it may not be fully developed. The sulphite in the developer will remove the last of the yellow stain, and it is advisable to give the print at least three minutes to ensure that the blackening is complete. Fixing is not necessary, but thorough washing is recommended, otherwise developer retained in the print may oxidize and cause stains.

If the print is still too weak, the process can be repeated, but the increase in density becomes less with each treatment, and little is gained by more than one repetition.

The chromium intensifier can be of considerable value. It is often very difficult to judge the best density for a print from wet test strips by artificial light, and since some papers, particularly chlorobromides, seem to dry darker, the print can safely be made slightly weak to allow for this, knowing that if it is too light, it can easily be intensified to the required density. Where highlight gradation is important (as in snow scenes), the method is not recommended, because, as explained in Chapter 4, the highlights should be printed rather too dark, and then reduced to give the best quality. For exactly the same reason, shadows printed rather weak, so that they do not encroach too far into the knee of the curve, and then intensified, have better gradation than could be obtained with a straight print. Probably more subjects fall into the latter category, and since overall reduction is usually very chancy, prints erring on the light side can be remedied more easily than if they are too dark.

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For contrasty subjects where shadow detail is the more important, it is often a good plan to make the print deliberately weak and slightly soft, and subject it to considerable intensification. On a chlorobromide paper, the resulting tone and quality could not be matched by a straight print.

There are many other toning processes, but those described are among the most useful, and it is far better to become really familiar with a few, than to dabble with many. There are very few snags, and some of the reasons for uneven toning have been discussed

There is one other, however, and that is the use of local reduction before toning. As explained previously this affects the silver grain size so that where the colours produced depend upon the warmth of the original image, any variations in grain size will tend to cause uneven toning.

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# 8

# Spotting

Spotting is a tedious job, for not only is it rather exacting — if it is to be done well — but it lacks the artistic urge which will sustain interest throughout a session of oil reinforcement. The desire to create is strong in many, but only the true craftsman can look upon repairs, as other than the minimum work needed to 'make do'. For that is what spotting is; it is repair work. Our medium, as any painter will tell you, is mechanical, and that hair embedded in the negative emulsion, and which produces a wavy white line on the print, is a flaw in its physical perfection, like a scratch on the enamel of a brand-new car. The appearance of the print is spoilt, and the feeling of disappointment that such a blemish should be allowed to mar it, will persist unless the work of removing it is sufficiently well done. Indeed one often sees prints where the spotting is worse than the original defect!

The work is not easy, but it is a technique at which every serious photographer must become adept, and it is surprising how absorbing blending a large spot into the background can be. It is the sort of job which can well be done to a radio accompaniment, for if part of the mind is interested in something else, the tedium which promotes haste and failure does not develop. The eyes can look, and the ears listen independently, and I must confess that I do most of my spotting to a musical background.

With one exception, which I shall mention later, spotting should be done before any dope is applied, and by far the best medium is water colour. Dyes I do not recommend. A dye is a solution, and can only be employed wet, whereas water colour is used as a suspension of pigment particles held together with water, and can be applied on a brush which is relatively much drier. To stipple

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with a wet dye-loaded brush is virtually impossible, because each dab must leave a small drop of moisture, and these unite to form one big blob. It is also not so easy to match the dye to the image tone, and in some cases the dye, which is seldom dead black to start with, changes colour with time. If too much water colour is applied, a moistened fingertip will fetch it off instantly, and no harm is done, but the dye stains the emulsion, and can only be removed by prolonged soaking.

Pencils have a limited use, but the results are not very permanent. For all but glossy papers, carbon pencils are preferable, as the ordinary graphite pencils leave a shiny mark. If, after pencil spotting, steam from the spout of a kettle is played on the print, the emulsion swells slightly and partly absorbs the deposit, making it less easily rubbed off, but it will still not survive doping. Dope will remove the pencil marks even if they are steamed, but as explained later there is no reason why pencilling should not follow doping.

For glossy prints the shiny mark of the graphite pencil is quite appropriate. The spotting should be done before glazing, and providing the prints are soaked quietly, so that the pencil is not rubbed off by other rapidly circulating prints in a washer, the glazing will seal the spotting quite effectively.

Water colour takes much better on a glazed surface, if it is mixed with a little gum. This can be done quite easily by twirling the moistened brush on the flap of an envelope before picking up the pigment; after glazing, of course.

Now let us consider in detail how to spot with water colour. It is a subject on which there is very little information: most photographers learn the hard way, and the purpose of this chapter is to make it easy — or less hard. First, it is important that the colour should match that of the image. The range of colours needed will depend on the toning processes employed: bromide black will match all fully developed bromide and fast chlorobromide prints, while ivory black will suit the warmer chlorobromides.

Matching gold, chromium, and sepia-toned prints, can be quite a problem, but I have discussed the technique necessary in the chapter on oil reinforcement, where it is even more exacting.

Spotting is simplified by working to a system. First, match the

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colours, and if they have to be mixed, the left thumbnail forms quite a useful palette for the very small quantity of pigment needed. Now if it is a large print from a small negative, there may be a fair number of spots, no matter how carefully the processing has been done, and don't forget that those odd highlights on the window frame, or a bright white shirt on a distant figure, are almost as distracting as blemishes due to dust on the negative. Carefully examine the next print which needs considerable spotting. The spots will probably occur in shadows, middle tones, and highlights (white spots, that is; for black spots should have been removed already by chemical reduction), and that is the order in which they should be tackled.

Moisten the brush, and twiddle it in the colour so that it is liberally loaded, and leaves quite a heavy deposit, and attack those spots in the shadows. The beginner habitually works with too wet a brush: this is fatal to good results; the brush must be as dry as it can be, consistent with leaving any deposit at all. The brush should be pointed, and the colour concentrated in the tip. It should be held almost vertical and the colour applied by dabbing, so that the tip just touches the paper and leaves a dot. One dot may be sufficient to fill a small spot, but larger areas are filled by stippling, which means laying down a number of dots close together, so that the effect from a reasonable distance is of an even tone. Newspaper pictures are built up in much the same way. Do not attempt to draw with the brush, because a painter's stroke is quite distinctive, and will introduce a false note in a photograph. The water colour is used to imitate the photographic image, and stippling is the only way to so do, although a long white line due to a scratched negative can often be removed when in an even tone area, by stroking a lightly loaded brush along it.

Carefully matched densities are not necessary in the shadows. When the brush becomes too dry, moisten it again very slightly. I use the tip of my tongue, which I believe is unhygienic and not recommended, but it seems to work very well, and to have had no ill effects so far. Don't recharge it, and if the deposit is now too light for the shadows, transfer attention to spots in the middle tone areas. Here more care is needed, and should the spot be sizable,

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particularly if it is in an even-toned area such as blue sky, the job is doubly hard. It is not quite so difficult in a variegated surround: try to visualize the interrupted pattern, and by careful stippling, restore it. It may be that a small twig should cut across the blemish: if so, complete it with the heavily loaded brush, and come back to match the lighter areas later. By restoring the twig, the spot will have been divided into two smaller ones.

The very regularity of some large spots often proves one of the biggest problems, because the outline is so clear. Again, try to break up the shape by using, and extending existing patterns. Fig. 8 shows how darker areas may be continued into the spot to destroy its symmetry.

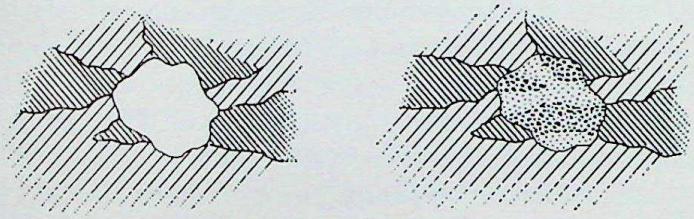

*Fig. 8. Spotting. Extending the pattern into the blemish*

The filled-in spot should match its surroundings, both in colour and in texture, and to obtain a smooth effect the stippling should be very fine, and preferably rather too light in tone, so that it can be built up gradually. One often sees blemishes which have been filled in with a few heavy dots which pass from a distance, but are revealed by their coarse structure when the print is examined more closely.

Eventually the brush will be almost exhausted, leaving but the faintest trace behind. Don't recharge it yet, for in this condition it will match those spots which appear in the highlight areas, particularly clouds. The faint deposit needed can only be achieved by progressive exhaustion, it is quite impossible to pick up the minute trace of colour required straight from the palette.

Even more troublesome than spots, are the long white lines due to scratches on the negative, and particularly prevalent with

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35 mm. film in velvet trapped cassettes. An array of these, stretching right across a 20 in. by 16 in. print, and above all if they are in the sky, may well dismay even the most ardent spotter, for the number of dots required for stippling approaches astronomical figures. To remove them successfully is indeed difficult, for once the line of the scratch has been noticed, the eye, critical as always, will scan where it knows it should continue, and the work must be good indeed to stand such scrutiny. The principle of dividing large blemishes into smaller ones is again appropriate, and if the line can be interrupted by carefully restoring the breaks it leaves in prominently patterned areas, the job will look, and, therefore, be easier, once the continuity is destroyed. As previously stated, the brush can, with practice, be stroked along the line where it is in an even tone, thus saving the labour of inserting a few of the many dots required. The secret lies in an almost dry brush with but little colour, applied with the lightest touch possible.

Probably the most convenient way to deal with these lines is to use water colour to match the darker areas, and carbon pencils for the remainder, particularly in the sky. It is not easy to obtain a heavy mark with a pencil without digging into the paper, so use the water colour first, then dope the print, and while it is still tacky draw carefully along the lines with a carbon pencil. The pencil should be held very lightly, and if even then difficulty is experienced in drawing faintly enough, lift one edge of the paper, so that the surface gives when the pencil presses upon it. When hard, the varnish in the dope fixes the pencil marks.

But while I have dealt at some length with spotting, for it is an important, if not a very inspiring subject, it should never be forgotten that it is a cure, and that prevention should be the aim. Apart from the scratches, which are caused by abrasion, almost all spots are due to dust, in or on the negative, which impede the progress of light through it. The dust embedded in the emulsion has no doubt fallen on it, while it was wet. The value of drying negatives in as still and dust-free an atmosphere as possible, is obvious. Preventing dust from falling on the negative while it is in the enlarger, is not easy, and not all enlargers are designed to tackle this problem really seriously. The negative and carrier

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glasses, and the condenser, if this serves as a clamp, should be dusted carefully with a soft brush: they should never be wiped with a handkerchief, or the electrostatic charges on the glass will tend to attract dust quite literally as a magnet draws steel. It will probably be necessary to do this every time an exhibition print is to be made, but this small precaution will save quite a lot of spotting later on.

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# 9

# Oil Reinforcement

This is a much-maligned process, which many so-called purists condemn as a sticky hybrid of oil pigment and photography. But it is only the bad examples which show so clearly the nature of the control: of the good, where the operations have been performed with care and restraint, they are generally unaware.

It must be admitted the process seeks to deceive, simulating with oil colour certain characteristics of the photographic print. Oils used by a painter assume a distinctive texture, but are applied by the photographer as an even tone akin to the silver image of his print. Their individuality must be submerged, and the secret of successful oil reinforcement is that the work which has been done should be hidden, so that by no falsity of tone value, no obvious change of texture, or of colour, should it be revealed. Why condemn a technique which, when properly used, helps the photographer to make his pictures tell their story with greater sincerity and unity?

The photographer's inherent good taste must tell him the limitations of the process — and he must not abuse it. It is a strange fact that as a photographer acquires fresh apparatus or processes which extend the scope of his work, he will devote himself almost exclusively to them, until with time the novelty wears off. A camera with a much faster shutter than before, will result in a spate of swooping seagulls; an electronic flash, in efforts to arrest motion in all kinds of fantastic attitudes; and, alas, a bottle of dope with an overpowering urge to smear oil over every print just for the sheer joy of it. When I was introduced to these methods I soon discovered that I could fill in the whole of a blank sky with quite passable-looking clouds, and I even sent a print to

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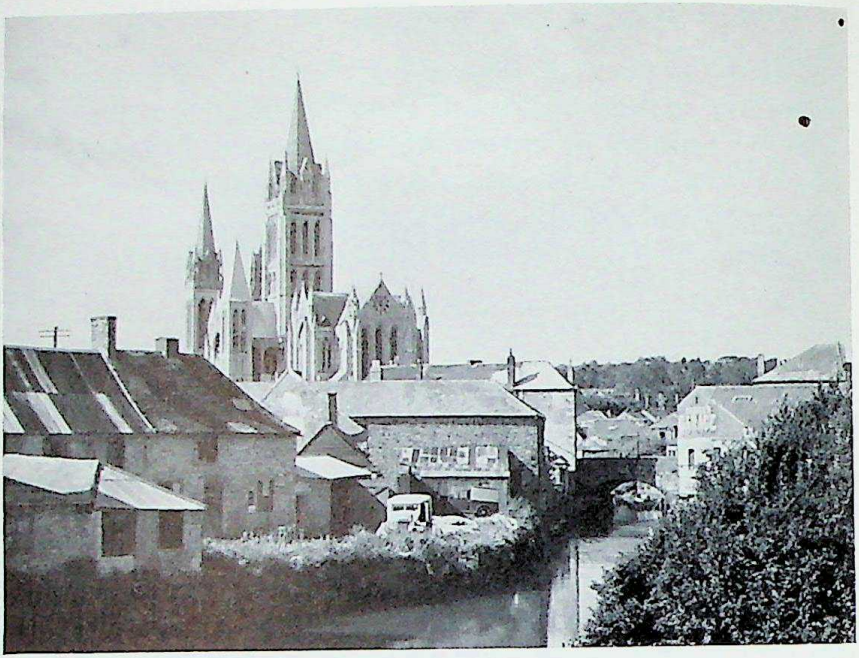
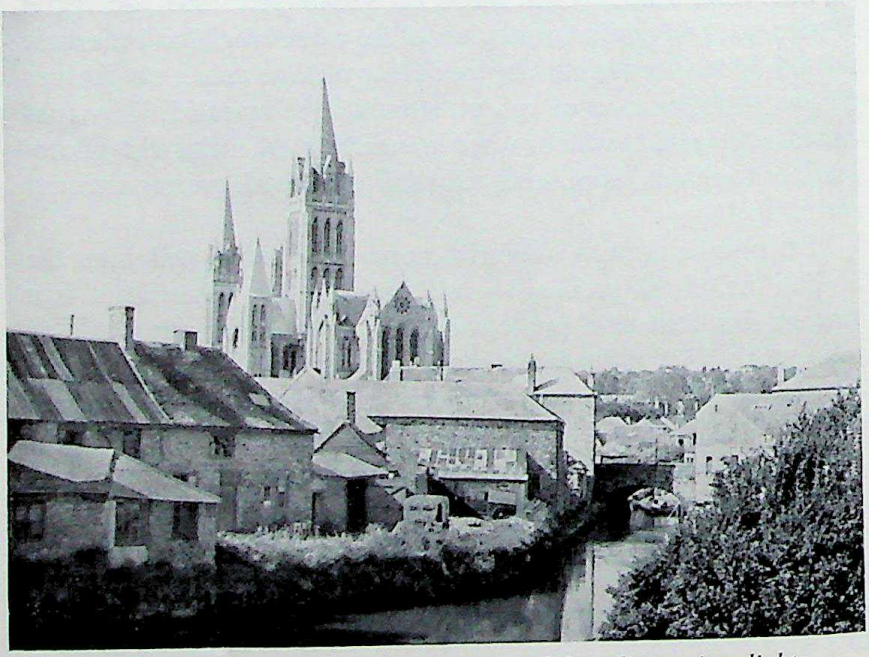


43. *Truro Cathedral*



44. *Showing the use of oil colour to subdue distracting lights. Note the lorry and the 'Garage' sign*

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my local camera club exhibition treated in this way, and it was accepted. Now I shudder when I look at it, not so much that it was in bad taste, but because I now realise that much better clouds can be added by combination printing.

Oil reinforcement is a perfectly fair, and very sound technique in its own right, which no serious photographer can afford to ignore. It is used for a specific purpose, and is often combined with other forms of control: above all, it is not a means of salvaging poorly made prints. The oil is smeared on with a wad of cotton wool and worked into the print so that the added tone is quite even in texture. It is virtually a fog which will degrade any area over which it is applied, and so will have the effect of toning down highlights without any noticeable darkening of the shadows.

Consider Plates 43 and 44 and see how the oil colour has subdued the lorry, and strips of bright corrugated iron in the roofs. So definite, and in some cases complex, are their outlines that printing up would have been virtually impossible.

A limitation of projection control is that if the assertive area shows a strong interwoven pattern of light and shade, and with good gradation in all tones, the extra exposure required to dim the lights, will make the shadows black and toneless; but a thin veil of overall density such as is applied by oil reinforcement, will subdue the lighter parts without destroying the quality of the shadows.

In a reproduction this subtlety may well not emerge, but consider the right-hand wall, and the roofs of the shops of Plate 45. In a straight print there is gradation in the heavy shadows inside the near windows, but the stonework of the wall is rather bright and jazzy, while the roofs being toneless, detract from the brilliance of the whitewash below. To force appreciable tone out of the highlights of the roofs, without making the shadows too dark would be almost impossible, and if the right-hand portion of the print were given any more exposure, those already rather deep shadows would block right up. With oil colour it is easy, a veil over the granite walls subdues the brilliance of the pattern, the tiles can also be darkened, and then the joins between strengthened with pencil. Thus although parts of the print have been fogged and

45. *Unretouched print*

46. *Roofs and right-hand wall overprinted*

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47. *Roofs and right-hand wall subdued with oil colour*

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degraded, the effect of brilliance is not lost, because the attention is concentrated on the area where it is strongest.

Now for the operation of the process. The print must first be prepared by applying a medium which provides a key for the oil colour. That most frequently used consists of:

| | |
|---|---|
| Mastic Varnish | 1 part |
| Linseed Oil | 1 part |
| Turpentine | 2 parts |

All to be artists' quality materials.

This forms a slightly viscose fluid which causes the oil to drag slightly, and facilitates control; but it has one disadvantage. It is yellowish in colour, and even when thinly applied tends very slightly to stain the whites. In most cases this doesn't matter at all, it merely imparts a faint ivory tinge which would not be noticed, but the tendency should be avoided for subjects such as snow scenes where the utmost purity in the whites is needed. For these a colourless 'dope' can be made up as follows.

| | |
|---|---|
| Turpentine | 3 parts |
| Poppy Oil | 1 part |
| Celluloid in Amyl Acetate | 1 part |

(The celluloid is dissolved in the amyl acetate until it becomes viscose).

This solution is quite clear, but forms a rather thinner medium which does not provide quite such a good key for the oil. It also needs to be shaken well before use, as there is a tendency for the ingredients to separate.

The medium is applied on a wad of cotton wool, using only just sufficient to cover the print evenly. Rub it in well, and then remove the surplus with a clean wad. The print should now appear rather richer, particularly in the shadows, and when tilted to reflect the light the surface should be quite uniform. Any tendency to patchiness indicates that either the application, or removal of the medium, was not sufficiently thorough.

Even if it is not intended to oil the print subsequently, the process is still of value for the dope restores part of the sparkle which the wet print lost when it dried, it conceals spotting, and by

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covering the surface of the paper delays fading due to the chemical effect of atmospheric impurities — three very useful factors.

The oils to use are ordinary tubes of artists' oil colour — bromoil pigments are rather too hard for easy application. But it is seldom that the colour in any one tube will be just right, and it is most important to match the image tone of the print. Failure to do so will show surprisingly clearly. The danger seems to lie in applying the colours too warm, since both ivory and lamp black, for instance, when smeared on thinly, become quite brown, and are even warmer in tone than some chlorobromide prints. If the print is toned the problem is even harder, and to match a chromium-intensified Plastika print where the colour is a warm black tinged with crimson, can be really tricky.

I have found Winsor and Newton's blue-black artists' oil colour to be a good match for most bromide prints, although a good neutral black can also be obtained by mixing ivory black and Payne's grey. A mixture of ivory and blue-black in varying proportions will suit most fully developed fast chlorobromides, but as the colour gets warmer it may be necessary to use ivory black and raw umber. Chromium Intensifier and Selenium impart red and purple tinges to the image which require the addition of crimson plus possibly cobalt blue to the pigment. Gold toning is another difficult one to match, because the final colour varies so much, and starting with blue-black, it may be necessary to add either cobalt or prussian blue or Payne's grey for the correct effect.

Squeeze out the pigment on to a white glazed tile, and unless the pure colour to match is known, mix other shades with it until the tone is felt to be right, and then spread it out on the tile. Dab a wad of cotton wool in the colour and smear it on the doped print, rub it in evenly and see if it really does match, this is the crucial test, on the print. Don't be content with a close-up verdict, scan it from several yards under a bright light. Probably the first trial will not match. Analyse the way in which the colour varies from the image tone. Is it too warm, or does it need just a touch of red? Add a trace of the deficient pigment, and work it in evenly with the oil already on the tile. Wipe off the colour on the print with some dope on cotton wool, remove the excess with a clean wad, and then

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try again. Continue until from all angles, and all distances, the colour really appears to be a perfect match. It may well be asked, by what light should the colour be examined? However, prints are seen under both artificial and daylight, and I usually find that if they pass by one type of light, they pass the others; so I don't think it matters providing the light is bright enough to reveal all the tone values; but if it is done one evening by artificial light, it is a good plan to look at it next morning to see if it still seems right, before it is too dry to be rubbed off.

When the balance is correct, smear the oil on boldly where it is wanted. The result looks frightful — but don't be scared — the dope will remove it if necessary. Work it in by rubbing with a circular motion, and preferably keep applying it until it is quite even, but a little too dark. Then rub it off gradually with a clean undoped wad until the right depth is reached. This encourages a more even deposit than building straight up to the required density. Similarly it is better not to try to confine the colour exactly within the boundaries of an irregular area, but to allow it to extend where it is not wanted, and to clean off the overlap afterwards.

When the work is finished the print should be put away to dry where it will be free from dust: it can stand in a cupboard or lie in a drawer, but nothing should come in contact with the surface while it is tacky.

When it is really dry, which will take about a week or more, it will be seen that when tilted to reflect the light, the surface is quite blotchy, dull under the oil colour, and shiny elsewhere. Prints are often left like this, and many a judge or critic will verify his suspicions, by looking obliquely at it for the tell-tale marks. This effect can be remedied quite easily in one of two ways depending largely upon the type of paper surface. On many prints the dull patches can be brought up to match the rest of the surface merely by polishing with a clean wad of cotton wool. Alternatively, the whole print can be redoped and when the surplus has been wiped off, put away to dry a second time. This final operation is most important. It is the blotchy appearance of so many oiled prints which gives the process a bad name.

Not all paper surfaces respond well to oil reinforcement. On

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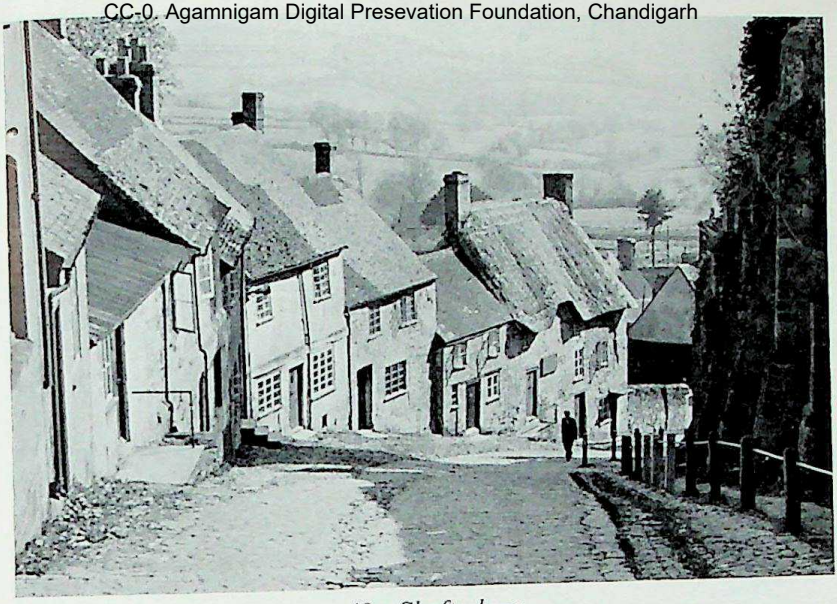

48. *Shaftesbury*

49. *Showing how oil reinforcement combined with overprinting has extended the shadow across the base*

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those with a rough texture, the oil tends to accumulate in the valleys, and to produce a granular effect, but papers of the semi-matt, finisher, and fine lustre types of surfaces are quite suitable.

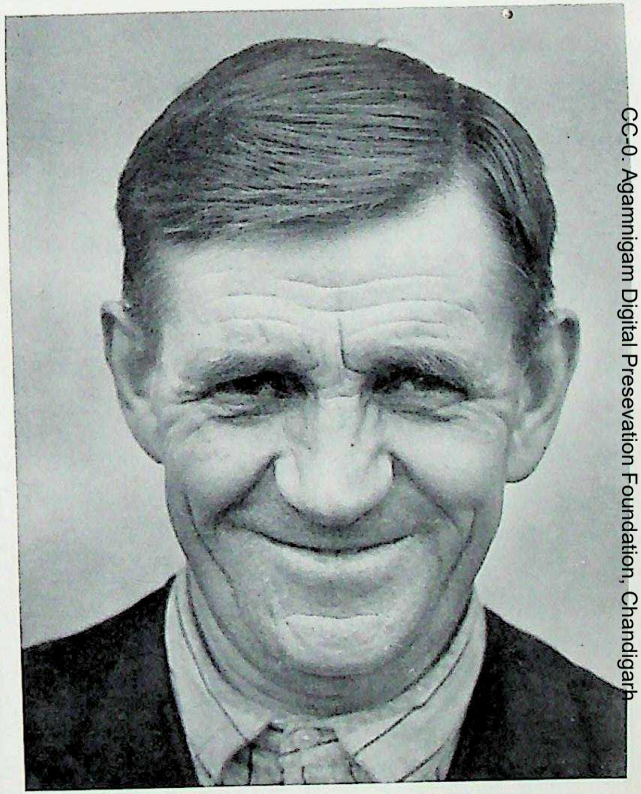
Although the principal value of oil reinforcement lies in subduing the brilliance of lights in contrasty areas, carefully used it can also introduce slight variations of tone in rather blank highlight areas. In a big print of Plate 32 it provided two little wisps of cloud in the bright patch in the sky to relieve its emptiness — a small touch, but quite an important one.

The power to apply control can often stimulate interest in a subject which would otherwise be abandoned as containing elements too much opposed to the unity of the composition or idea. Plate 48 shows a delightful street at Shaftesbury. I could ill-afford the twenty minutes I did spare to add my own exposures to the thousands which have already been made of this particular scene. The lighting was beautiful, five o'clock at Easter with a low bright sun, but the edge of the shadow thrown by the high wall made a crazy line down the middle of the cobbles and quite spoiled the foreground. But I waited for a suitable figure, and took it all the same, because I thought that jarring note could be eliminated afterwards. Plate 49 shows how this has been done, by extending the shadow across the road so that it is cast across the nearer houses. See how this simplifies the foreground, and concentrates attention on the further cottages and the workman coming home. It may well be that the long shadows created could never exist with the present lighting, but does it really matter? Would a painter have refrained from extending the shadows if it had suited his purpose?

The bogus shadow has been produced by a mixture of overprinting and oil colour; — and it is instructive to consider the reason for this, and the effect of using each one of the two processes separately.

The contrasts in the shady side were obviously less than in the sunshine, where also the negative was rather overexposed due to the generous exposure required for the shadows. In a straight print as in Plate 48 the shadow detail will be of fair quality, and compared with it the sunny side will be contrasty, but with the

50. *Straight print*



51. *Background control with pigment*

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lighter tones lacking gradation, and the darks (study the gaps between the cobbles) less dense than in the shade. The task was to make both the lights and darks on the left similar to those on the right, so that the characteristic quality of the real shadow could be extended into the sunshine. Using oil only, the lights could have been darkened, but the tonal quality already lacking would become even flatter so that the new shadow would look muddy. With local overprinting, the darks would have become too dense long before the lights were sufficiently subdued.

The solution was therefore just sufficient local overprinting to bring gradation into the lights, and to darken those gaps between the cobbles until they matched the shadow side, followed by oil colour until the lights were equal in density.

As explained earlier, no attempt was made when oiling to follow the complicated contour of the edge of the shadow. The oil was allowed to overlap, and was then taken off the shadow with very small pledgets of cotton wool, and finally right up to the join by means of an artist's stump.

These stumps, which consist of absorbent paper wound into the form of pointed spills, are useful for adding or removing oil on small detail. Even finer work can be done with a spotting brush, which can also be used to break up the evenness of a small oiled area by applying a semblance of tonal gradation. For instance, the shading tends to leave a strip of cobbles to the edge of the shadow slightly weak, and the quality is restored by brushwork.

In some cases spotting with oil is better than water colour, and this is particularly the case where the spot is relatively large, and occurs in an even middle tone area.

A plain background is usually better than a fussy one, but tends to be monotonous. Plate 51 shows how pigment has been used to add tone and variation to the surround. For low key portraits, it often pays to render the background as a plain medium grey, and to build it up with oil colour, so that the shapes of parts of the head and shoulders can be accented or softened as desired.

The distracting highlights on leaves, etc., so often found behind outdoor portraits, can similarly be subdued, but it must not be overdone, or the subject will appear brightly lit against a back-

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ground of unnatural gloom. Experience — and your critics — will tell you how far you can go.

Well, there they are: those are the methods I employ, and I trust the reader will find them useful. I hope also that those who have not practised 'Print Control' before, may be tempted to do so, for I am sure they will find new interest in this fascinating hobby of ours. Do not be discouraged if the first attempts are unsuccessful, for if the methods were too easy, there would be little gain in using them. The craftsman's work bears the stamp of his skill, and that only comes from experience.

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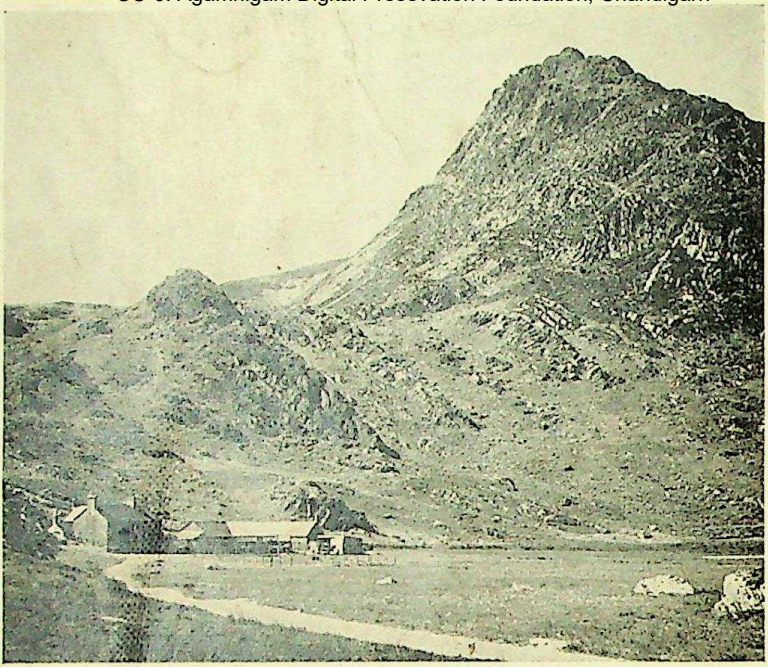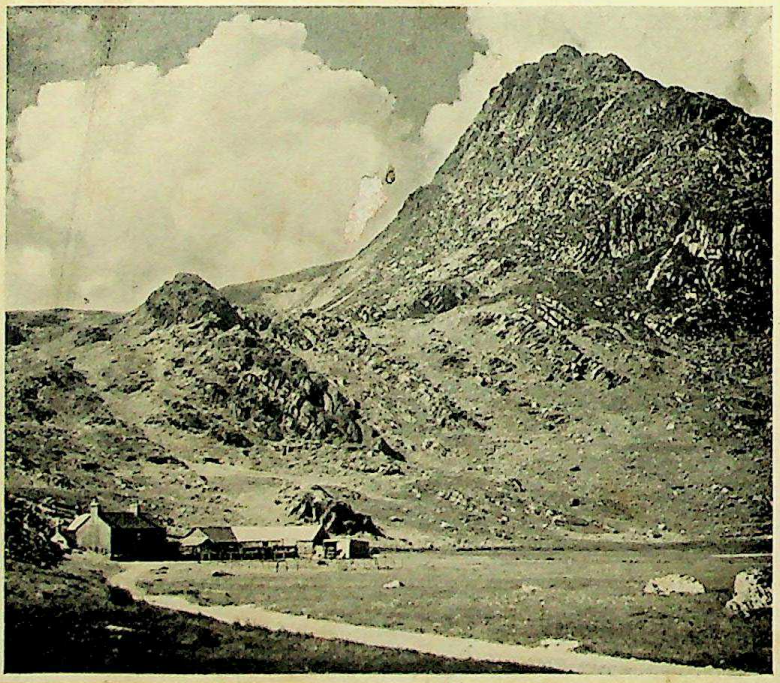
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